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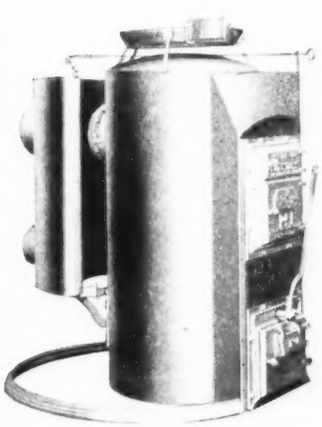

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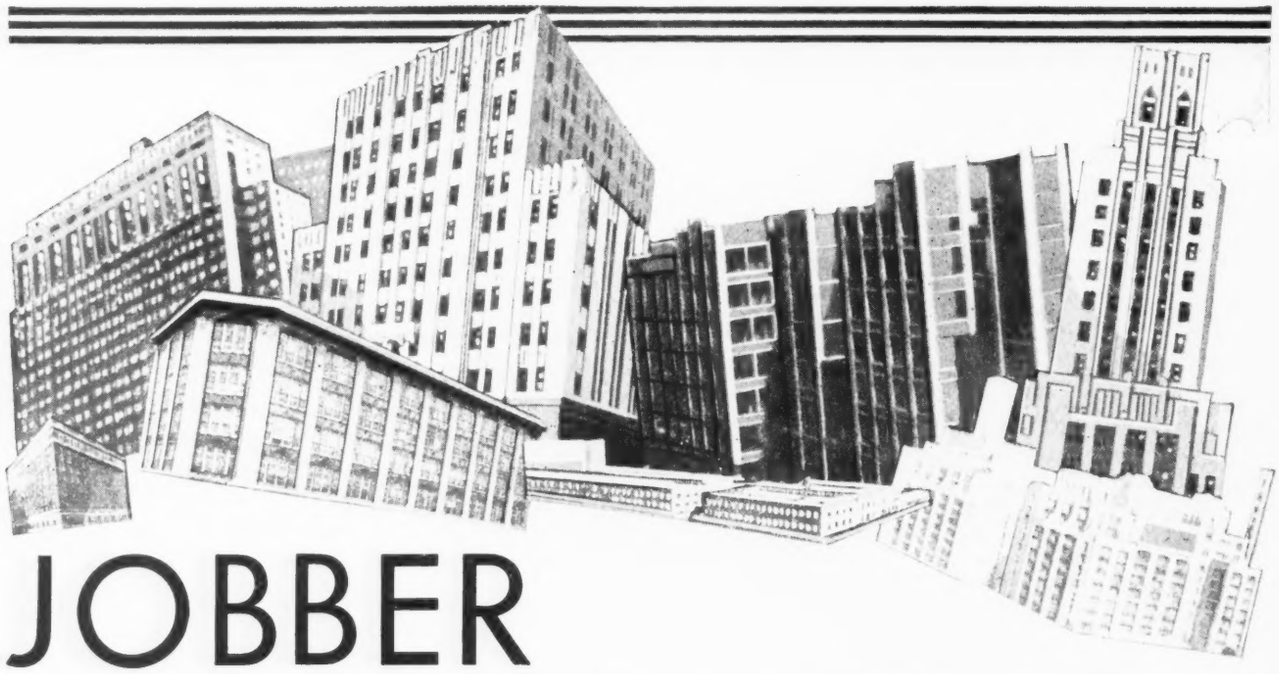

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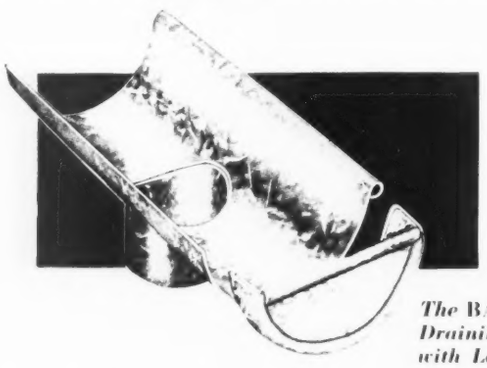

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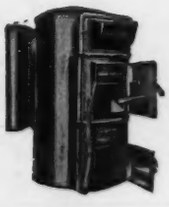

The coal-burning Western has built a reputation that has carried the gas furnace to popularity heights. The demand is still great for the veteran Western—where gas is not convenient.

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Sheet Metal Contracting
Air Conditioning
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Sheet Metal Contracting
Air Conditioning
Industrial Roofing
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JANUARY 4, 1932

VOL. 101, NO. 1

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Editor

Platte Overton
Engineering Editor

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Shielding the Giants from Salt Sea Air

Salt sea air that sweeps over the giants of the Atlantic City Boardwalk is bracing for men, but brutal to most metals.

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Architects specifications for the Parthenon unearthed

Copy of strange document found in ancient Greek ruins

"Old Man Phidias is raving about his Pallas Athene. If even a drop of rain falls on her sacred nose, I'm sunk. Let's take no chances. For roof, downspouts, and all ornamental work I specify GOHI (pronounced go-high). Remember, it's gotta last until 1931 — and, believe me, that's a long way from here. Dated at Athens the third day of April, B. C. 447."

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Volume 101 AMERICAN ARTISAN Number 1

Warm Air Heating ✓ Sheet Metal Contracting ✓ Air Conditioning

Degrees of Air Conditioning

IN the November 23 issue of AMERICAN ARTISAN we set forth a proposed method for determining just how much air conditioning any given system offered the buyer. In that tentative arrangement we listed ten possible degrees of conditioning beginning with a plain gravity installation and ending with complete control of all properties of air within the home.

The response to that editorial was immediate. The letters received and personal comment by visitors nearly all agreed that some such system of measuring conditioning was essential, both for the installer and for the buyer.

There were, however, a number of letters disagreeing with some of the degrees and the arrangement of degrees. Of this group of letters one in particular makes us want to tear our hair. The writer said—"If you are talking about air conditioning, why drag in the gravity system?"

Our reason for putting gravity as the first degree is that even the simplest gravity warm air system, adequately equipped with water pans, gives more air conditioning than competitive systems equipped with cumbersome and expensive accessories. That being so, why in the world shouldn't we claim some measure of conditioning when we sell a home owner a good gravity installation? The answer is—we most certainly should claim to furnish heat, air movement, humidity.

We would like also to lay out another critic who says—"You place as the ending degrees ionizing, deodorizing, and treating for carbon dioxide factor. Most of us don't know what you are talking about, let alone know where to buy, or how to sell and install equipment giving these degrees."

As a matter of fact we admit that few of us in the industry do know much about these things, but the writer of the letter forgets that three years ago most of us didn't know what to do or how to use fans and blowers, yet today, less than three years later, fans and blowers are hardly thought about except to select them for quality of design and construction and for proper size.

That shows how fast this industry is progressing. And with just such progress will all these other little understood accessories of today become standard equipment of tomorrow.

One important thing should be impressed on the minds of all workers in the heating business. That thing is that as air conditioning becomes popular, every type of heating will be compelled to follow in our footsteps and regardless of whether or not they can give air conditioning will be forced to claim it.

Our salvation in this fight which is to follow will be in breaking down the general term "conditioned air" so that a prospect can understand for himself just what conditioned air means and how it can be supplied. By using a degree method, competitive systems can be compared point by point—to our benefit.

As we said in the other editorial, this degree system of determination will also put an end to the confusion and underhand methods of those contractors who agree to give air conditioning when in reality all they will give is heat, some humidity, and air motion.

It seems to us that this proposition is of vital importance. It is always better to clarify the proposition before the battle begins than to wait until everyone is up to his neck in work and then try to undo the things which have been going on for months or years. Because the public is ignorant of what this new system really is and because most owners believe that when they set out to buy air conditioning they are going to get for two or three thousand dollars the equivalent of the $100,000 machine which serves their favorite theater, a positive and loud backfire is sure to result.

It is up to us to make the public understand that in air conditioning they are going to get just what they pay for—the more money they are willing to spend the more air conditioning—the less money, the less air conditioning.

Every reader who has installed forced air systems during the last twelve months has undoubtedly pictured to the prospect the advantages of our system. We should like to know just how much conditioning they have claimed and what they have given in exchange for the buyers' money.

New Dallas First Gas

The new home of the Dallas Gas Company is one of the most modern structures in the Southwest

IN the last few years, air conditioning in office and commercial buildings has become widely recognized as the natural sequel to the growing public interest in and acceptance of the importance of human comfort in the workaday world. The first adoption of air conditioning was, of course, the theaters and public buildings. This was followed shortly by the adoption of air conditioning to speed or control industrial operations. And now the field has been extended to include air conditioning as a profitable investment in office and commercial buildings.

The importance of this field to the ventilation contractor is visualized when we stop to consider the great number of office buildings and stores which can and eventually will use conditioned air to provide comfort and also attract customers or tenants.

Throughout the South this matter of conditioned air, especially during the hot months, has recently aroused much interest. The problem in southern cities is twofold—reduction of inside temperatures and the reduction of humidity. Both these problems are solved through use of conditioned air equipment.

Within the last few weeks there has been completed in Dallas, Tex., a splendid example of air conditioning as applied to a semi-public building where customer and employee comfort is decidedly advantageous. The building is the Dallas Gas Company's new home. This beautiful 12-story building has many unusual features, one of the most important of which is the heating and air conditioning system. The entire building is heated by gas in winter, and gas is also used for summer cooling.

As the first gas cooled building in the Southwest, this installation is attracting wide interest. In a country where summers are both hot and humid, the operation of the system will be watched with much attention by architects, engineers and the public.

The installation of the necessary duct work for the heating and ventilation system was done by the Dallas Heating and Ventilating Company, of which Harry Stanyer, vice-president of the National Association of Sheet Metal Contractors, is one of the firm members.

The air conditioning system in this building embraces the conditioning of the first floor office space and the basement salesroom. The system consists of a combination of ammonia compression refrigeration and silica gel dehydration. All of the sensible heat is removed in coolers which are supplied with cold

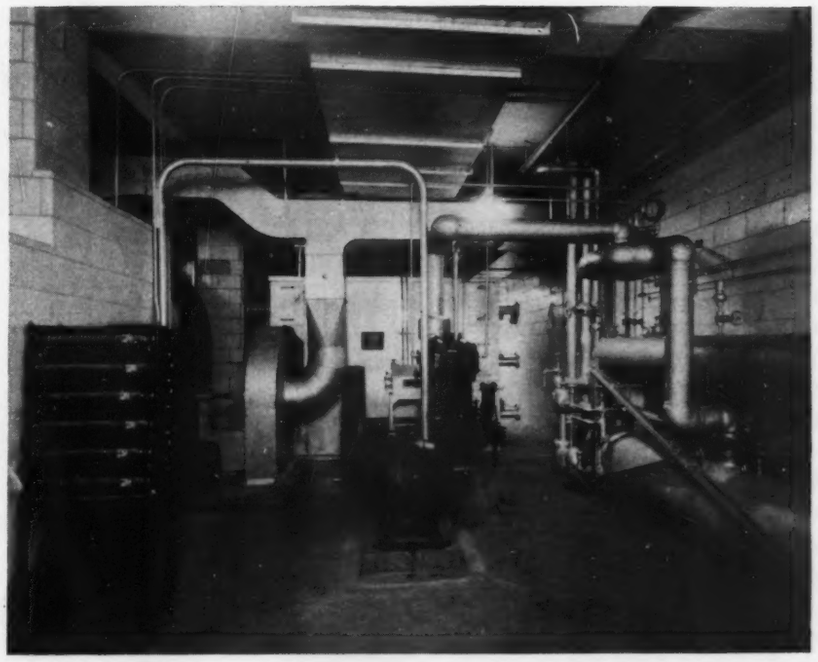
Inlets for air conditioning are at the floor—in this picture around the column bases. Outlets are at the ceiling—in this picture behind the light rosette. Winter heating is by the same upward flow system

Gas Co. Home—The Southwest's Cooled, Gas Heated Installation

water from the refrigeration machine. The fresh air supply is passed through the silica gel unit, where it is dehydrated to any desired low moisture content. This dried air is then mixed with the return air from the building and the mixture is cooled to the proper temperature for introduction to the conditioned spaces.

The silica gel method of air conditioning consists of passing the air over silica gel, a hard glassy material made from sand and sulphuric acid, which is honeycombed with microscopic pores and can take up 40 per cent of its own weight in water without increasing in size. After the moisture is removed, the bone dry air is blended with ordinary air to attain the required humidity and then cooled. After the silica gel has become saturated with water vapor from the air it is dried out for use again by the application of gas heat.

There are two main air distribution systems, one for the basement space and one for the first floor space. Each system has a separate main cooler to provide individual control of the temperature in the two areas. Only one fan is installed to supply and withdraw the air from the conditioned areas. The air is properly proportioned by dampers on the two systems.



The air conditioning machinery is shown here. Silica-gel machine in background, compressor in center, condenser at the left, water cooler at the right

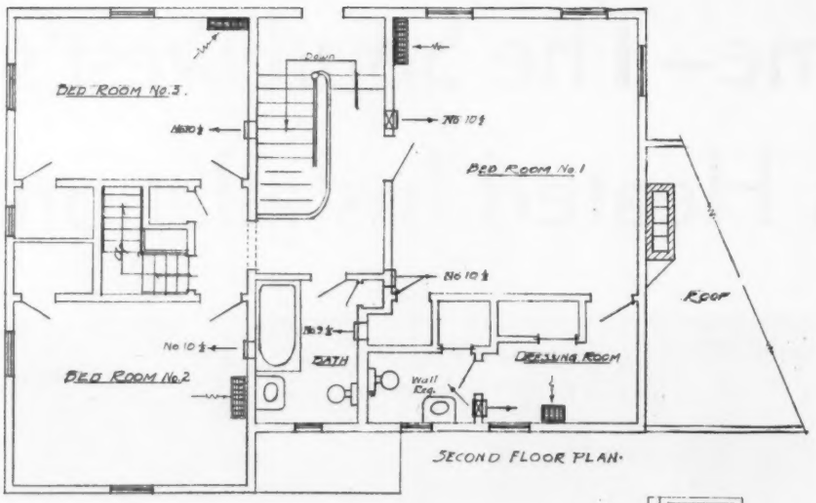
The air is distributed in the conditioned spaces by the so-called upward flow method. The supply grilles are located either in the floor or in the wall near the floor line, and the air is withdrawn through the grilles in the ceiling located in ornamental design above the lights. The air is introduced through the supply grilles at the floor and moves gently upward as it picks up the heat in the room in its passage to the ceiling, where it is withdrawn through the outlet grilles. The grilles are of a pleasing ornamental type and can scarcely be detected by the layman.

The system is arranged for heating during the winter season. Steam will be introduced into the coils of the main coolers in place of water. The amount of heat fed the coils will be automatically regulated to deliver air in the two areas at a predetermined temperature. The relative humidity is controlled also in winter by an automatic valve which will introduce sufficient steam directly into the air stream to produce the predetermined humidity.

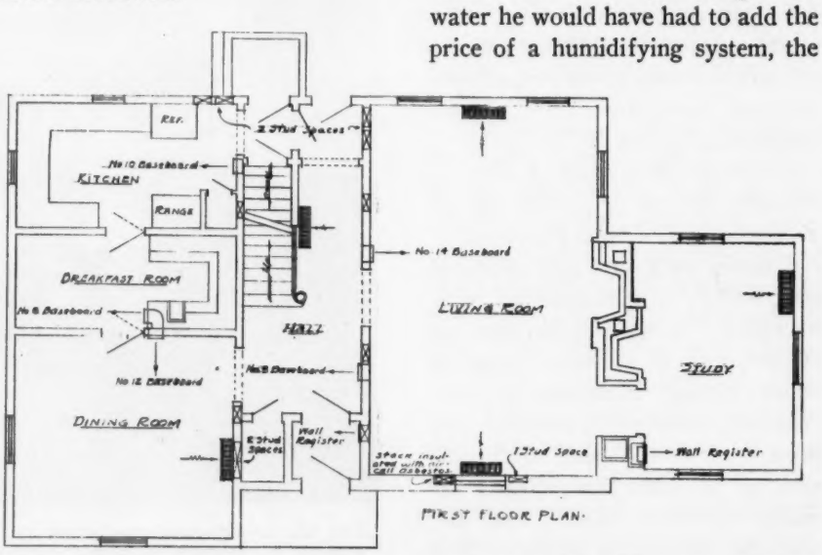
The volume of the first floor conditioned space is 134,000 cubic feet

TABLE I

When Outside Conditions are (Degrees F.)			The Inside Conditions will be (Degrees F.)		
Dry Bulb Temp.	Wet Bulb Temp.	Effective Temp.	Dry Bulb Temp.	Relative Humidity (Per Cent)	Effective Temp.
		SUMMER			
100	80	87	88	35	78
90	75	81.5	83	35	74.5
85	75	79.5	80	40	73
80	71	75.5	77	50	72
75	67	71.5	75	60	71
		WINTER			
0	....	.....	75	50	70



SECOND FLOOR PLAN.



FIRST FLOOR PLAN.

Above are the layouts of the first and second floors. The placement of cold air grilles is particularly effective and neat. Another feature is the general compactness of the warm side with registers grouped to the center of the building

baseboard registers are used throughout for warm air except in the vestibule and study. The interior photograph gives an excellent view of the neat-appearing register in the living room, which handles this entire room itself.

A special construction was used to supply warm air to both dining room and breakfast room through a separate baseboard register in each room.

On the second floor, a 3 by 12 wall stack is run from a No. 10½ baseboard register box to feed a wafer register located about five feet above the floor line in the bath room. A stack of similar size is run to the attic from the No. 10½ box used for heating bedroom No. 1.

There is a wood cold air face in each of the four important second floor rooms. Air from the three bedrooms is brought to the basement in two studding spaces from each room, only one space being used for the dressing room. Each studding space is lined with galvanized iron.

A very good "spacing effect" of the cold air faces was designed for the first floor. Reference to the basement plan will show how the sources of return air were located so as to bring all air into the furnace room, using only the spaces between joists. An excellent symmetry was obtained in the living room by placing a cold air face at each end in the center of the wall.

Excepting in the kitchen, every occupied space in this residence is equipped with air inlets and cold air outlets located in such a way as to distribute the air supply as evenly as possible throughout each room at a low velocity, at the same time keeping in mind the items of cost and the useless occupation by heating equipment of otherwise valuable space.

The owner of this house claims that his installation is an outstanding example of economy. He is satisfied that it positively eliminates the drafts and other discomforts he feared. And his is now sold on the idea that the results obtained are gratifying because the air is in motion. This system was installed at a total cost less than a hot water heating system. He now understands that if he had bought hot water he would have had to add the price of a humidifying system, the price of some device to change the air in each room four times per hour and then have the inconvenience of bulky radiators in each room, and the worry of rusting pipes or freezing water.

Every room, except the kitchen, has both inlet and outlet. This assures complete circulation. Here is the living room baseboard register. Its location was carefully chosen so that free circulation is certain and not hampered by furniture

A Single Pitch Skylight

By W. R. HAINES
Contributing Editor

THE single pitch skylight embodies the fundamentals upon which all skylight work is based. Therefore, the person who understands the method of laying out and developing the single pitch skylight should have little difficulty in laying out and developing skylights of more complicated design.

We, who follow skylight work, too often resort to the wasteful and somewhat crude methods of simply trimming down the separate integral parts of the skylight till they fit into their respective places. Why do we do this, knowing that a few minutes' time spent over the drafting board will often save us both time and material? Perhaps it is because we are ashamed of our skill as a draftsman, or else dislike to visualize our problems. What can other professional men, such as architects, engineers, heating contractors, building inspectors, steel workers, etc., think while watching a man trim down a skylight rafter bar until it fits into place?

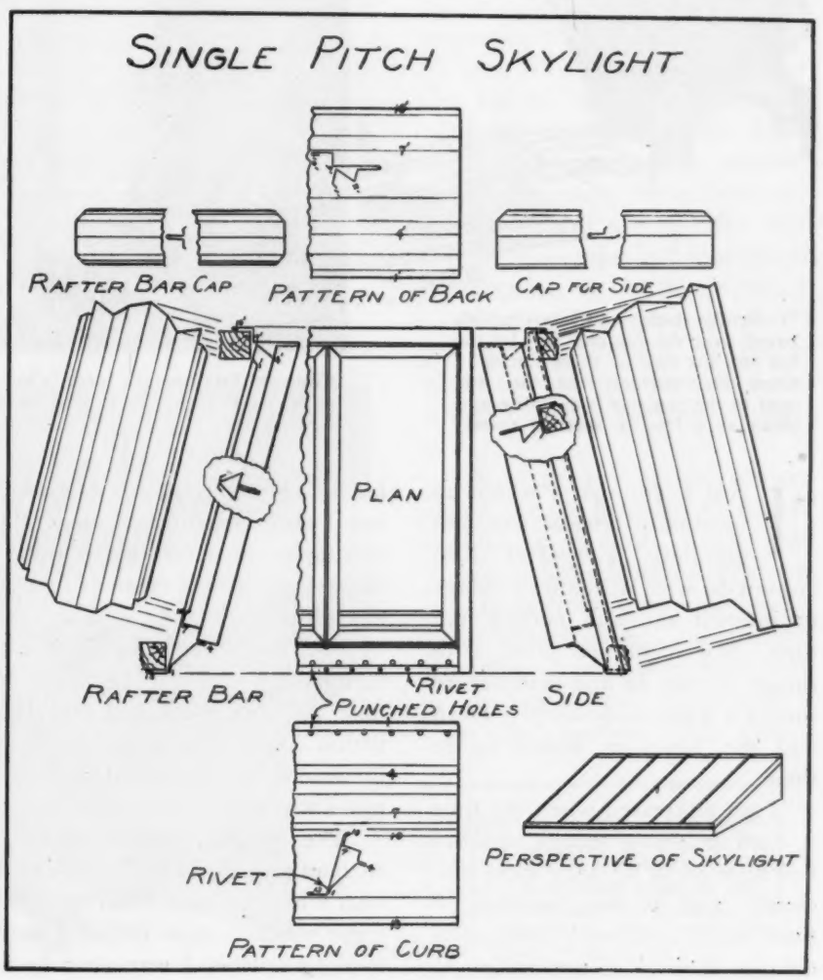
The skylight shown in the drawing is commonly known as the single pitch skylight. The skylight should be designed with sufficient strength to withstand the maximum water and snow loads. The maximum water and snow loads can be decreased with increased pitch, although the wind load increases with increased pitch. Skylights usually vary from one-quarter to one-half pitch with the majority of tradesmen preferring about one-third pitch.

The procedure in laying out the skylight pattern is to located the position of the front and back wood cross members with respect to their distance apart as shown in the side view of the side or the side view of the rafter bar. Then draw in the side view of these members themselves. Next, draw in the plan view of the skylight. It is now a simple problem to develop patterns of the side, rafter bar, curb and back. The patterns are then laid out on the metal, and the pieces are formed as shown by their sectional views.

The edges where the two gutters of the rafter bar touch are often soldered, thus increasing the strength of the bar. The sides and back are also soldered where the edge of the gutter touches the rest of the members. It might be well to explain the purpose of the small gutter on the side, back and rafter bar to those who are totally unfamiliar with skylight work. These gutters are commonly known as condensation gutters, and their purpose is to remove condensation which collects on the inside surface of the glass.

Slotted holes are driven through the curb at the bend, shown by point 7, by a small chisel as soon as the curb has been riveted. This allows the condensation to pass inside the curb and then outside through the punched holes.

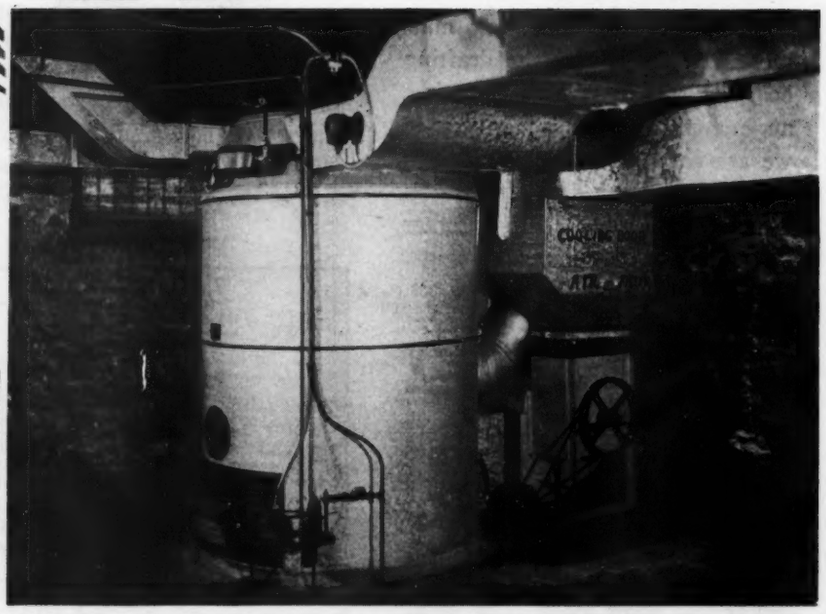
All that remains for the men on the job, is simply to nail the sides, back and curb to the wood frame. Then solder these pieces including the rafter bars together along their edges. The pieces of glass are next put into place and putty applied to the edges. The rafter bar caps and the caps for the sides then are slipped into place. The job is then finished by pinching the sides of the cap with a tool made especially for that purpose.



"I Hope That Enjoy

BY

"I firmly tack a white turkish towel over the register and let the fan run for two or three hours. I show my visitors that the side next to the register is as white and clean as a freshly washed towel"



Contrast this modern installation with the old system shown on the opposite page. Is it any wonder that he 1931 housewife is interested in automatic air conditioning?

"I AM a feminist. Perhaps an unusually critical one, but certainly a typical 1931 housewife with a hundred things to interest me and occupy my time. My days are filled with things I must do and many more things I want to do only if I can find the hours in which to do them.

"I am distressed when my time is used in doing things which I feel sure could be done more efficiently and at less sacrifice of time by an improved mechanical device. While I do not profess to know anything about engineering, I do profess to be sufficiently intelligent to determine if something I possess is efficient or not efficient.

"I deplore seeing lovely home furnishings ruined because of dust and dirt, especially that dirt which I feel sure comes from an inefficient heating plant and the muss which accompanies it.

"The simple truth is that for so many years have I associated heat with dirt, that when the time came when I must install a new heating system I was very hesitant to accept the sales talk presented by heating men.

"Although I had good and sufficient reasons for having faith in Mr. Baumgartner of the Ba-Del Company, the contractor who installed my new system, I was so skeptical from many years' experience with furnaces that I really believe I remained doubtful until my own system had actually proved to me what it could do.

"I knew that much improvement had been made in heating equipment; I could not believe otherwise in view of the fact that

Every Housewife Will Some Day the Comfort and Convenience of A Heating System Like Mine"

AMELIA M. CRECELIUS

for the last few years advertisements and articles on heating have pointed out that my problem is that of thousands of other women and that anyone can now have a heating plant just as modern, convenient and clean as any of the other mechanical devices we now have in our homes.

"My home is not much different from those of most other women in my home city, St. Louis. It is a large, three-story, brick residence placed rather close to the street. It was built during that period in St. Louis history when large rooms, high ceilinged, were the vogue. The heating of this house had been a problem ever since I bought it. To say the least, the house was difficult to keep warm. In my case this problem of adequate heat is particularly acute since I do not require all this large house for my own needs and rent the second and third floors to tenants.

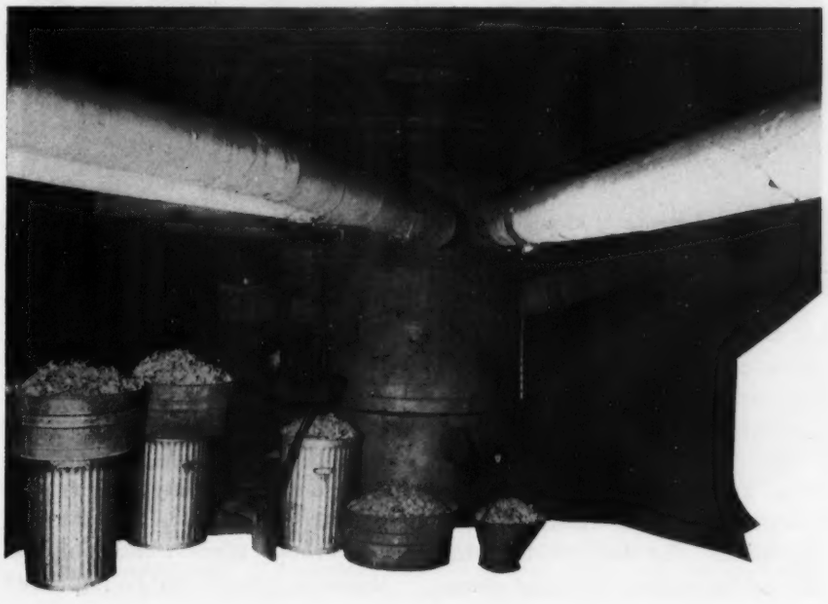
"As I look back on that period when I struggled with an inadequate system, I cannot help but wonder how I managed to keep the house livable. During severe winter months I actually shoveled more than a ton of coal a week into the maw of my furnace. And many mornings I crawled out of bed and began firing at four o'clock. At seven the house was barely comfortable.

"Had I been able to stop there, it would have been bearable, but all day long the furnace demanded attention. Late in the evening I was still busy maintaining a fire. And this went on day after day whenever the temperature approached zero.

"Anyone can imagine that this heavy coal consumption brought with it frequent deliveries of fuel, with their muss and dirt. The constant attention to the furnace could not help but keep a film of dust circulating throughout the rooms.

"Is it any wonder, then, that the stories of modern heating with its clean, circulated heat, maintained without any personal attention seemed like a dream to me? And is it any wonder that after such a system had been placed in operation in my house that I can find too few words to sound praise to the heating contractor who took off my shoulders the weight of work previously necessary?

"Since the new system has replaced the old furnace and its associates, soot, dust, ashes and cinders, I know that heat can be cleanly delivered into one's home by means of correct engineering principles. I have very little dust in my home now. None comes from the furnace. All comes



"Many a morning I got up at 4 o'clock and fired my furnace till 7 o'clock so that my rooms might be warm. More than a ton of coal a week went into my furnace. Do you wonder I am enthusiastic about modern heating?"

Miss Crecelius' home is a typical large St. Louis home as they were built a generation or so ago. Solid brick, load-bearing walls, heavy construction insure permanence, but large rooms, high ceilings and open archways make an adequate heating system necessary

solely from windows and doors. I should also mention that no oil odors permeate through the house.

"Draperies and furniture now keep presentable much longer and naturally there is less depreciation.

"I made a very interesting test that seems worthy of mention. I firmly tacked white turkish towels over two registers, one on the first floor, another on the third. With the fan going continuously for two and a half hours, offering every possible chance for dirt or smudge to pass through the registers, I found the under side of the towels as white as the other. This simple test proved conclusively to me that there is absolutely no smudge coming through the registers into the rooms.

"I am also greatly enthused because my new system is so absolutely human. No matter where my work or activities take me I know the heating plant will do its work silently and automatically.

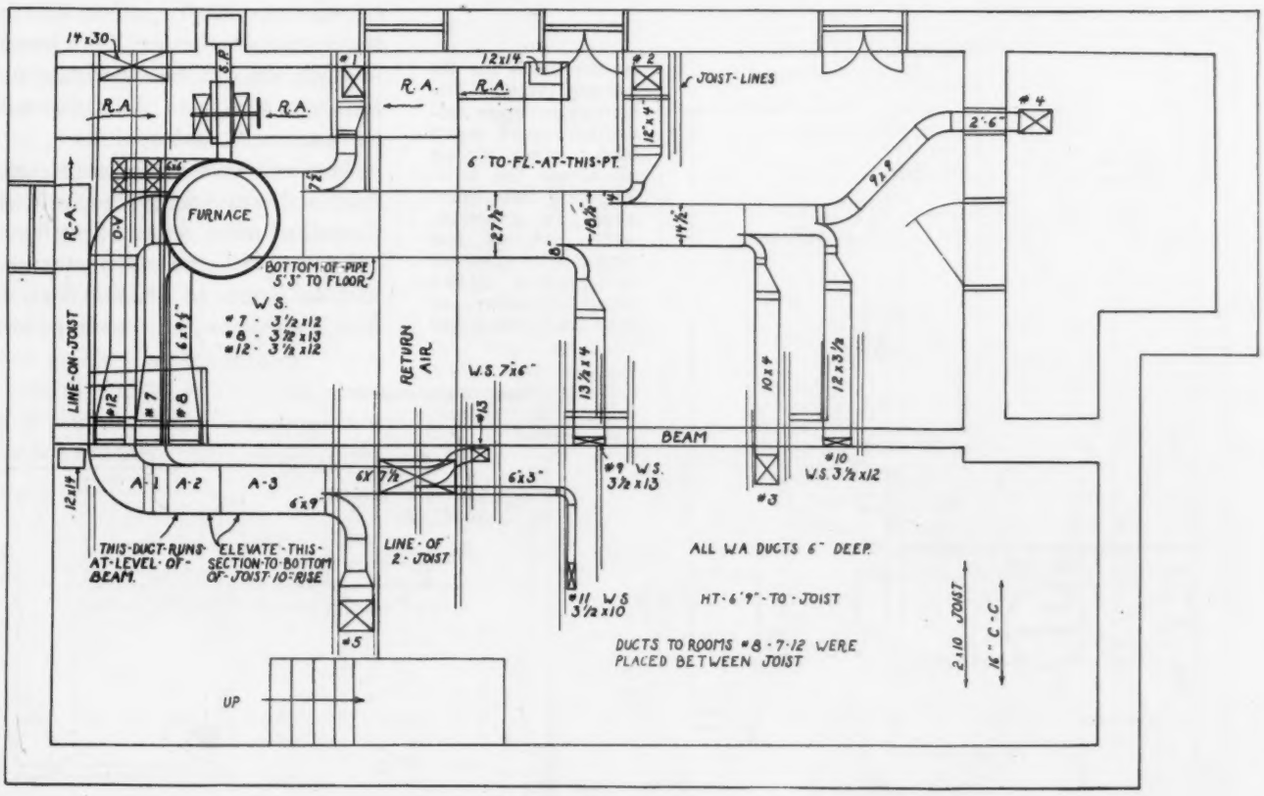
"Perhaps housewives would like to know something about fuel consumption. It is natural for persons to query about that. I am not so fully prepared to make definite statements since the weather conditions in Saint Louis were unusually mild this past winter. However, I can say that during late January and February the circulation of healthfully humidified, properly tempered warm air throughout every nook and corner of the house on all floors and without effort or inconvenience and free of all dirt, was maintained at the rate of an average daily oil consumption of eleven gallons, readings having been made from the oil gauge every twenty-four hours. At 7c per gallon, the daily cost during the colder period averaged something like 88c per day for oil. The usual price was 66c per gallon. This figure does not include the small extra cost of the gas pilot light nor the electricity used by the thermostatic control. On mild days the oil consumption was less.

"My rooms averaged 74 degrees as some tenants desired it very warm. My residence consists of ten rooms and two spacious halls. For a proper, healthful temperature of 68 to 70 degrees less fuel would have been used. It appears, then, that in my particular situation my fuel bill should be considerably less per season and in addition exclude all furnace dirt in the basement and rooms.

"Naturally, I am proud of my heating plant. To me it is a constant source of delight and never ending wonder. That any mechanism could so completely change my days and evenings from a nightmare of worry and back-breaking labor into days and evenings when I do not have to lift a finger to keep my house comfortable, is more than enough proof that truly this is a mechanical age in which anything is possible.

"Perhaps these wonderful machines will some day be improved

"I deplore seeing lovely furnishings ruined from dust and dirt, especially from that dirt which comes from constant handling of large volumes of coal to an antiquated, leaky furnace"



BASEMENT PLAN

This plan shows the layout of the new system. Compare this plan with the photograph below and notice how the ducts are handled to conserve head room. Note also that the furnace is out of the way, with the ducts run in two main leads

upon. I do not know. But I do know that I should like to see every other feminist enjoy the wonderful convenience and comfort I am now experiencing."

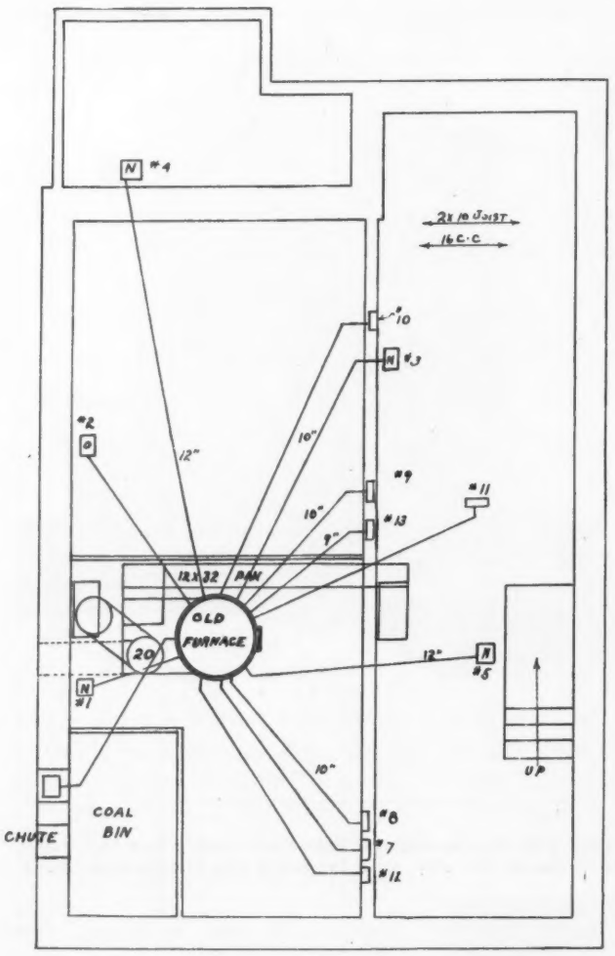
Editor's Note—The heating system which Miss Crecelius speaks of so proudly consists of one of the new unit heating plants, this particular one being a large size Piatt oil burning furnace with a Furblo blower. Reed filters, automatic control and automatic humidifying apparatus. We now have many similar unit systems, all offering under one casing the conveniences Miss Crecelius praises so highly.

There are several features about this job which Miss Crecelius did not mention. Miss Crecelius mentions, for instance, that she was so skeptical of all heating systems that she invited several contractors in to tell their story. We should like to add that to the discredit of the furnace industry several of those contractors assured her that her present system or old layout was sufficient to heat her building, but fortunately during her procrastination the weather convinced her that this would be a waste of money on her part and she finally consented to an entirely new installation.

The new heater is in one corner leaving desirable floor space in the center of the basement clear. The windows now throw light all through the basement, where before light was cut off by pipes, the furnace, and the coal room

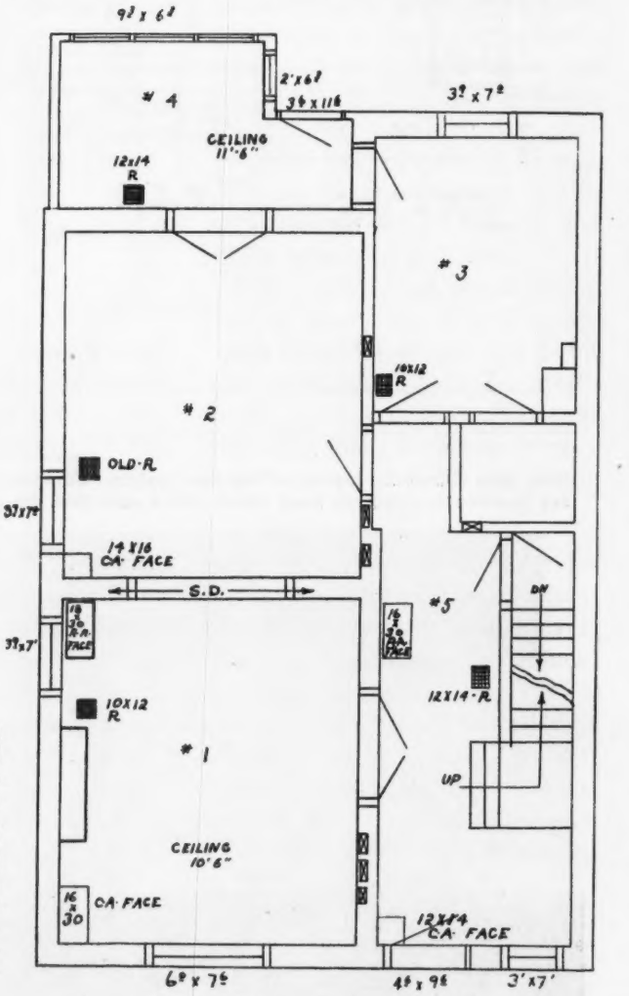
In this connection there is reproduced with this article a table showing how the original installation was sized. In addition there is given sizes according to Standard Code. How foolish, then, for these other so-called heating men to tell her that all she needed was one of their furnaces in place of the one she had.

The plans which are shown give details of the old system and also show the new one designed by Mr. Baumgartner. In this sys-



BASEMENT PLAN

At the left is the old heating system. The furnace occupies valuable space with leader pipes strung all across the floor. The long runs, operating by gravity, were certainly one reason why constant and heavy firing were necessary to keep the house warm



FIRST FLOOR PLAN

The first floor plan shows how some of the old cold air registers are now converted to warm air. Additional return air grilles were placed especially to the north and cold areas of the floor. Considerably improved circulation is now possible

tem he has made excellent use of a goodly number of modern features of design and installation.

Take for instance the revised basement layout. The old furnace stood well in the center of the basement with its pipes spread all across the floor. The new system places the furnace as close up in a corner as possible and supplies the air through two rectangular ducts which provide plenty of head room and permit light to illuminate all the desirable center portion of the basement.

The two warm air trunks are excellent examples of compact, out - of - the - way arrangement. Branches are taken off the trunk as close to the boot or stack as possible. In most cases these branches are reversed so that the height is flattened out as the branch goes across the basement. Dampers are placed at each take-off so that some control over the individual room temperature can be maintained by the owner.

In all cases the old stacks and registers were used. The registers, it will be noted, are all of the floor type, excepting the second floor bath which is high on the side wall.

Miss Crecelius told us that with the old plant it was next to impossible to get heat to the third floor rooms, but that now these rooms are more than warm. In addition, whereas the third floor became practically unbearable in the summer before, in warm weather she can now circulate the air from the third floor through the basement and cool it.

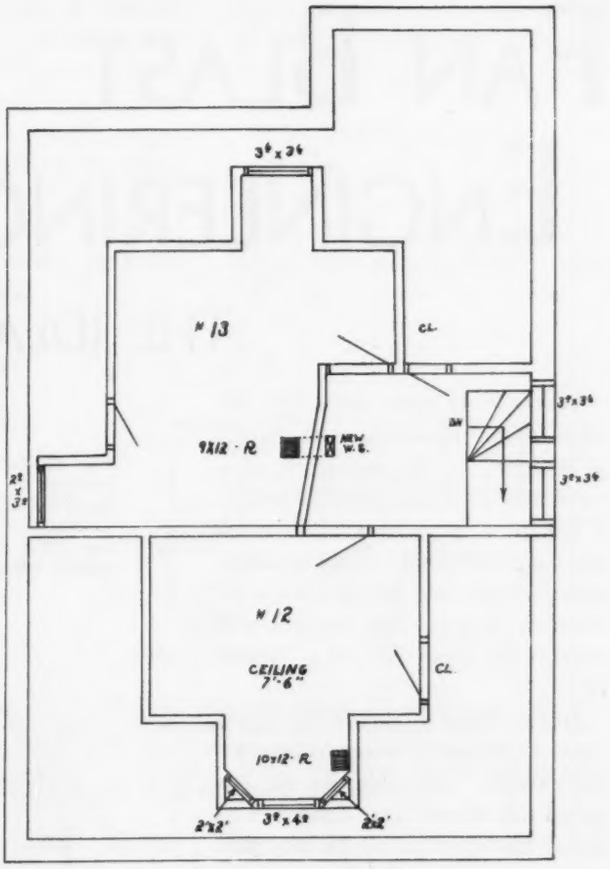
The new system is controlled from a thermostat placed in Miss Crecelius' office on the first floor. Whereas with the old heater she had to begin to shovel coal at four o'clock in the morning, she now has only to reset the thermostat from the night setting of 68 degrees to the daytime setting of 70 degrees between six and seven o'clock and then go back to bed.

The alteration in the basement appearance is little short of remarkable. Contrast the pictures of the old with the new and then say that heating men of 1931 haven't anything to offer the public.

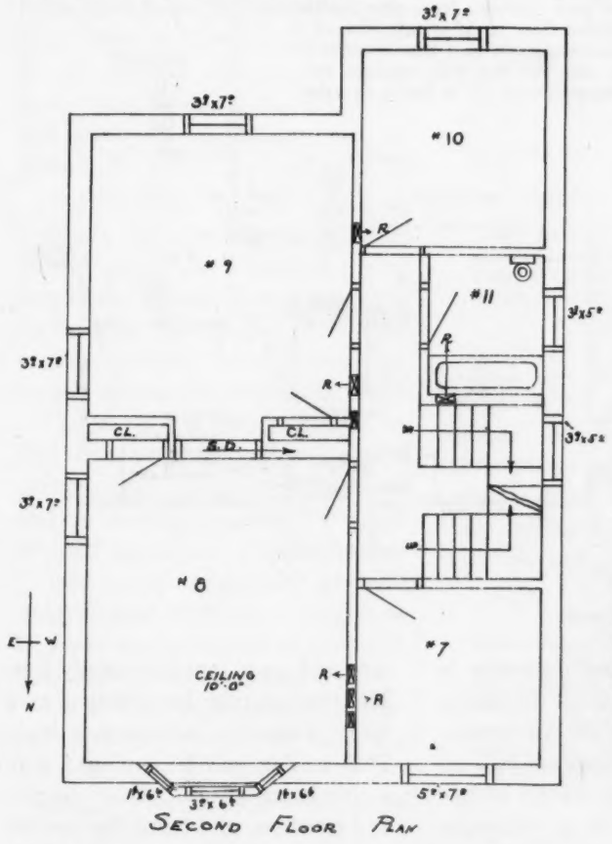
As the author stated all the air

passed through the furnace is filtered. When the new blower was first turned on, several years' accumulation of dirt was blown out of the pipes to the consternation of both owner and contractor. Inside of two days, however, this was all brought back to the filters and caught and since then Miss Crecelius has been able to conduct her justly famous towel test as often as she wishes. There certainly is a good thought in that simple test. Imagine how impressed any one must be to see a white turkish towel removed from an hour's contact with a register and still be as clean as the top side.

At the right is the third floor plan. One warm air register is placed in each room and return circulation is through the stair hall. Whereas it was impossible to heat these rooms on the old system, the rooms are now warm in winter and cooled in summer



THIRD FLOOR PLAN



SECOND FLOOR PLAN

At the left is the second floor plan. No return air was added because of the cost and also because tests showed that there was adequate circulation through the stairhall

When the system was newly completed thermometers were placed in the coldest spot on all three floors and the dampers adjusted so that all three registered alike. Now if one tenant wishes five degrees more heat than his neighbor a small movement in the branch damper will do the trick.

It is interesting to note that since the system was started the section of filters serving air coming from the front hall has been practically the only part of the filter bed getting fresh dirt. This dirt, of course, comes from the outside door, but the operation illustrates how dirt in the other parts of the house is cleaned out and kept so.

Miss Crecelius, the author of this article, is a typical housewife. Like hundreds of thousands of other women she dreaded the heating season because of its added work. Her comments on the satisfaction derived from automatic heat can be used point by point as sales ammunition

FAN BLAST ENGINEERING

By PLATTE OVERTON
Heating Engineer

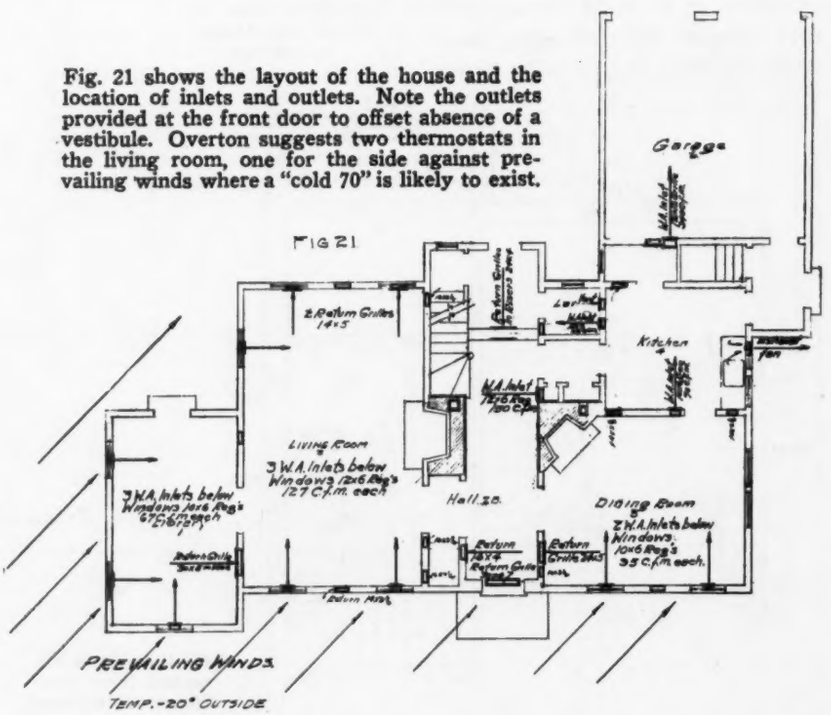
THE IDEAL SYSTEM

Where glass areas are large, the inlets should be arranged as shown in Figure 23. The occupants of a room may sit in 70 degree air within 3 feet of a large area of exposed glass and feel cold. This is sometimes termed *cold 70*. A curtain of warmed air over this surface will change the "cold 70" to a "warm 70."

In the writer's opinion the living room in Figure 26 should have two thermostats. The inlet on the exposed side should have deflectors to divert the warm air in the direction of the exposed wall. That this inlet temperature must be higher than the inlet temperature of the inlet on the other end of the room is obvious, hence the two thermostats.

Every well air conditioned home should have vestibules. Vestibules counteract cold drafts and prevent much of the dirt and dust that is carried into the home by the drafts or on the feet of the occupants. Our house of the problem has no vestibule and in Figure 21 we see the method employed to overcome a bad condition.

Fig. 21 shows the layout of the house and the location of inlets and outlets. Note the outlets provided at the front door to offset absence of a vestibule. Overton suggests two thermostats in the living room, one for the side against prevailing winds where a "cold 70" is likely to exist.



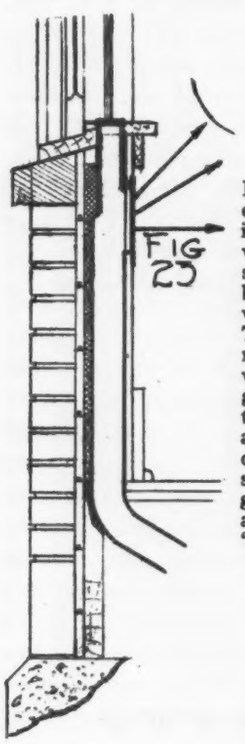


Fig. 23 shows one method of introducing a warm air stream at the base of large window areas. This warm air, moving upward along the glass, lowers the dew point and hence reduces condensation. This glass air stream also eliminates "cold 70" near the window.

The kitchen is provided with an exhaust fan. This fan is manually controlled and is in excess of the air supply in c.f.m.

Our air cleaning apparatus may be filters or an air washer, or both. If we use an air washer, humidifying apparatus is not necessary.

When we say air washer, we are referring to a standard air washer. This washer will be equipped with a single bank of closely spaced spray nozzles spraying in the direction of the air flow. The eliminator plates are flooded from the top by a row of nozzles under low pressure and on a separate supply line. The washer may be operated as a spray washer or scrubber or both. This washer will be equipped with a circulating pump. Water supply, and overflow, and humidity control. If water at 50 degrees is available in sufficient volume in the summer months the washer may be used as a cooler.

Humidity and humidity control depend on the type of apparatus installed. If filters are used in place of an air washer the humidity is generally supplied by pans or sprays located in the warm air plenum. This humidifying apparatus is in most cases an intergral part of the heater unit and comes from the manufacturers as part of the unit equipment.

With the use of the air washer humidity is supplied by the passage

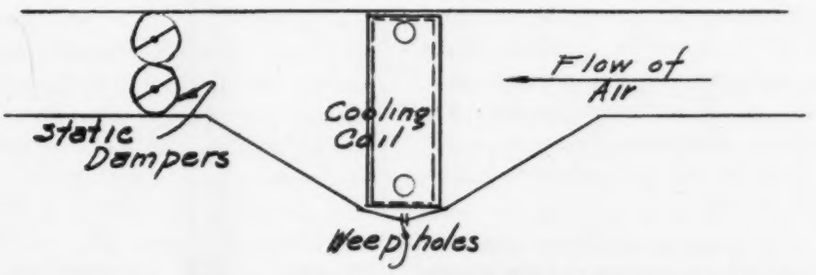
of the air through the spray water and the control may be maintained by either the control of the temperature of the spray water, or the control of the temperature of the air passing through the spray. Both of these methods throw a direct load on the heater, hence, effect the fuel bill. The humidity control may be maintained by the "off and on" control of the entire washer equipment. At the off position any cleaning service is of course eliminated and should be used only in conjunction with air filters. In some cases humidity control may be maintained to some extent by the use of solenoid valve on the spray header that would cut out the sprays and allow the scrubbers only to operate.

The location of the house in question, the cost of fuel, water, power, and the temperature of supply water and outside temperature are all items to be considered in the choosing of the humidity control where air washers are used.

Cooling is our real problem. At this time we must omit mechanical refrigeration. It is too expensive and no data is available. We will cool our installation with the washer if cold water is available or with water passed through cooling coils if water at 50 degrees in sufficient quantities is not available.

Let us refer to Figure 21, the installation in question, and work out theoretically our requirements for cooling. Our total heat loss for the building we will say is 100,000 B.t.u. per hour for a 90-degree rise —20 to 70 or 1111 B.t.u. per degree rise. Our cooling will work just the reverse and if we desire a 20 degree difference over outside temperature, we must remove 20×1111 B.t.u. equals 22,220 B.t.u. At 100 degrees outside temperature we can maintain 80 degrees inside.

FIG 26



Some cooling effect can be obtained with cold water (55 degrees or less) by passing the water through a coil like this and the air through the coil. However, Overton says, don't try to cool or dehumidify if your water supply goes above this on hot days, for it is on hot days that the owner wants cooling and you won't be able to give it with this equipment.

Not only must we drop the temperature, but we must remove or reduce the humidity. An inside temperature of 80 degrees with a relative humidity of 80 or 90 per cent will be far from comfortable, and we had better remain out of doors if it were 100 degrees with 20 per cent relative humidity or even higher, so far as comfort is concerned.

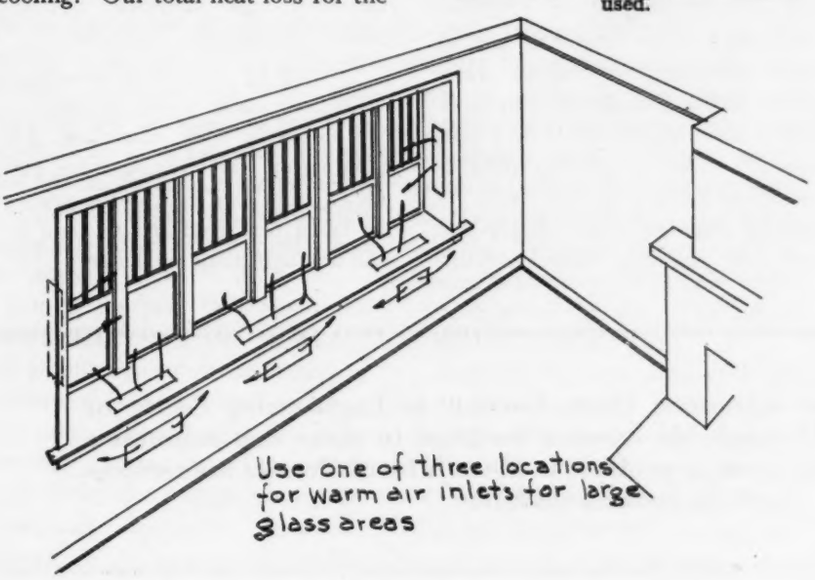
Our inlet temperature at the grille for cooling reverses itself from the heating requirement. Our library with 12,500 B.t.u. for a 90-degree rise equals $12{,}500 \div 90 = 139$ approximately per degree. If we heat 20 degrees we have 139×20 equals 2780 B.t.u. If we cool we reduce our B.t.u., hence our formula becomes:

$$\text{Room temp.} - \text{B.t.u.} \div (\text{c.f.m.} \times 1.07) = \frac{2780}{100 \times 1.07} = 13$$

and $70 - 13 = 57$ degrees for our inlet temperature to cool the library to 70 with outside temperature at 90 degrees with 200 c.f.m.

If we have 50 degree water available at the washer our problem of cooling is easy. As our return air passes through the water spray of 50 degrees the temperature is reduced to within 5 degrees of water temperature with one bank of sprays. Air at any temperature passing through the sprays will become practically saturated. Hence we have air at 55 degrees saturated and referring to our psychrometric chart we locate 55 degrees on the wet bulb temperature line. We pass to the right down along the angling line until we intersect with the 70 degree dry bulb reading from the bottom of the chart and on the percentage of humidity curved lines we read 38 per cent and is our percentage of humidity at 70 de-

Large window expanses can be protected from "cold 70" by introducing warm air at the base of the window by either of the three methods shown here. Just which location to use for the registers can be determined by the construction of the wall and the materials used.



grees room temperature.

As our air circulates throughout the house absorbing moisture as the temperature rises, it passes to the returns down to the washer and any excess humidity is left in the washer. This may seem paradoxical to the average person but, for example, we will say that the return air is 80 degrees and has absorbed enough moisture from the house to make this air 85 per cent relative humidity. Air at 80 degrees dry bulb temperature with 85 per cent relative humidity contains 9.35 grains, approximately, of moisture. Air at 55 saturated contains 4.5 grains, approximately, so it is obvious that the 4.85 grains is left in the washer.

Our exhaust or returns must be reversed for cooling and the return air taken from the ceiling, as shown in Fig. 24. Our cooler air settles to the floor as it issues into the room and rises as it heats.

As pointed out, our problem is solved if we have cold water and a washer.

Let us assume that we have city water at 60-65 degrees (too high for spray cooling) and desire the same results. We must build our own cooler and will calculate theoretically our requirements. We stated in a foregoing paragraph that our B.t.u. to be removed equals 22,220 per hour. We choose a coil from the catalog of any standard manufacturer. Our coil for 2000 c.f.m. at 500 velocity will be 2000 ÷ 500 = 4 sq. ft. Our water 60 degrees and we assume 4½ gal. per minute and 106 lineal feet of cooling coil will give us a temperature drop of 85 degrees to 65 degrees. This drop of temperature will be accompanied with a considerable condensation if the relative humidity is high in the return air and we must construct our cooling chamber in such a manner that this moisture will be forced out of the piping system. This is accomplished by reducing the throat area from the cooling chamber to the supply duct and the resulting static pressure will force the moisture from the weep holes in the bottom of the cooling coil casings. The opening from the chamber to the supply duct may be dampered for this result. The coil chamber may be so constructed that the coils can be removed during the heating season. While in service they may be supplied with water through garden hose connections. If water is metered and expensive, the house supply may be looped to carry through the coil and whenever taps are opened, cooling will be affected to some extent.

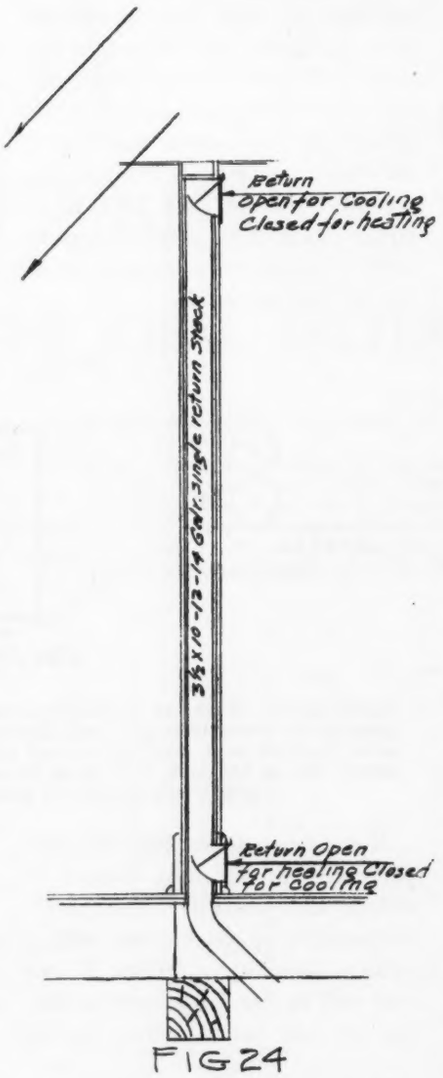


FIG 24

In designing the air conditioning system try to sell a double stack supply like this. Use both high side wall and baseboard registers equipped with valves which close tightly. Open the ceiling grilles and close the baseboard grilles when cooling and the reverse when heating.

We have all seen the cold water pipes "sweat." With this "home made" system satisfactory results may be obtained both for a drop in the temperature and dehumidifying. The cold water pipes should be insulated from the supply in the basement wall to the cooling coils.

A cooling and dehumidifying unit now causing much discussion is the "Silica Gel" system. Briefly, this unit is said to have two parts. One where the air is passed through the gel, where it is dehumidified and the other where the Gel is dried and the absorbed humidity removed and passed out of the building. As the writer has no data regarding this system the interested reader is advised to write to the manufacturers direct.

A summary of the cooling units for our ideal system leaves much to be desired. Cooling by refrigeration too high in price, and the power consumption prohibitive.

Cooling by air washer possible if 50 degree water is obtainable.

Cooling by coils; uncertain. Depending on water temperature, cost, etc. "Silica Gel" still in the process of being perfected and no data for the average home available.

It is with pleasure that we introduce Platte Overton as Engineering Editor of AMERICAN ARTISAN. Through his services we hope to make our columns a clearing house for your engineering problems. More information on his services will be announced later

THE California License Law

IN sheet metal and heating contracting, as in all other branches of the construction industry, conditions exist which indicate that the contract method of doing business may not be the best method. Probably in a contractor's Utopia there would be plenty of work for everyone on a cost-plus basis. As it is, it seems that no matter how closely a contractor estimates, someone else is certain to submit a bid in which the bare cost of materials, apparently, are not considered.

All branches of the construction industry have sought and are seeking ways and means to reduce competition. This is not so selfish a move as might appear at first glance, for unrestricted competition tends to deliver to the public shoddy work, hastily put up as cheaply as possible. The public suffers. The strong opinions that result reflect against all who do work by contract, no matter what the quality of their work may be.

At the same time it is against the best interests of the public to restrict free competition, even if it were legally or economically possible. But it is possible to restrict irresponsible competition. The various municipal licensing ordinances are in the nature of a restriction against completely free competition, limiting contractors to those who fulfill certain demands. Prequalification to do work according to certain standards is a reasonable restriction and is one that works both to the advantage of the public and the industry.

During the past 18 months, the sheet metal, heating and ventilating, and all other types of contractors in California have operated under a state contractors' license law. The law was enacted as a regulatory measure at the instigation of the construction industry. Its chief purpose is to protect the public from irresponsible contractors. Naturally, it also affords some protection to worthwhile sheet metal and heating contractors from the irresponsible members of their business.

So far, the law is merely regulatory and does not demand prequalification before a contractor may obtain a license to do business. The same state, however, has also enacted a law that requires the prequalification of all contractors who bid on state work. Persons submitting bids must have proven that they have the ability, financial standing, and integrity to complete satisfactorily what they propose to undertake. It is anticipated that some prequalification will be demanded of all contractors before they are given licenses, in the not too far distant future.

Free and open competition in the sheet metal and heating and ventilating trades has not been curtailed by the license law. But irresponsible competition has been reduced to a great extent.

What does the law provide for? It provides that all contractors who desire legal standing must hold a valid state license. It also provides that a license, once issued, may be suspended or revoked for any or various irresponsible acts, including failure to complete a contract, failure to abide by the plans and specifications, violation of the state workmen's compensation or safety laws, violation of the building codes, or diverting funds from one job to another. Anyone taking work in amounts as low as $200 falls within the scope of the law. The license costs five dollars a year.

Amendments now pending would reduce the minimum amount from $200 to $50 and would make the taking of a contract by an unlicensed contractor a misdemeanor. The law at present does not say that an unlicensed contractor cannot seek or obtain work. However, practically all municipal building departments and other building permit awarding bodies within the state now refuse to issue permits for any construction on which any contractor or sub-contractor is not licensed.

In other words, a heating or sheet metal contractor can hardly get along in California if he is not licensed. And having a license, he must act within the law if he is to retain it. Any of the above irresponsible acts are sufficient to deprive him of his right to continue in business.

Comparatively few heating or sheet metal contractors have lost their licenses under the law. The opinion of leaders in the industry is that the implied threat of the law has been enough to cause those who otherwise might be irresponsible to hew to the line. Poor workmanship can still be found, but when the work is not up to the plans and specifications, the sub-contractor is in danger.

There is no evidence that the law has reduced responsible competition. About 25,000 licenses in all divisions of construction are outstanding in the state, some 3,000 more than had been issued last year. No breakdown of these totals is available to indicate the numbers engaged in sheet metal and warm air contracting or whether the number has increased or decreased. The general assumption is that the number has grown.

Sheet metal contractors explain that by requiring a contractor to act in an ethical manner, the interests of the public are better served than before the law was in effect. All the men who bid on a certain piece of work are on a more equal footing, for none of them dare to plan to substitute materials for those

(Continued on page 30)

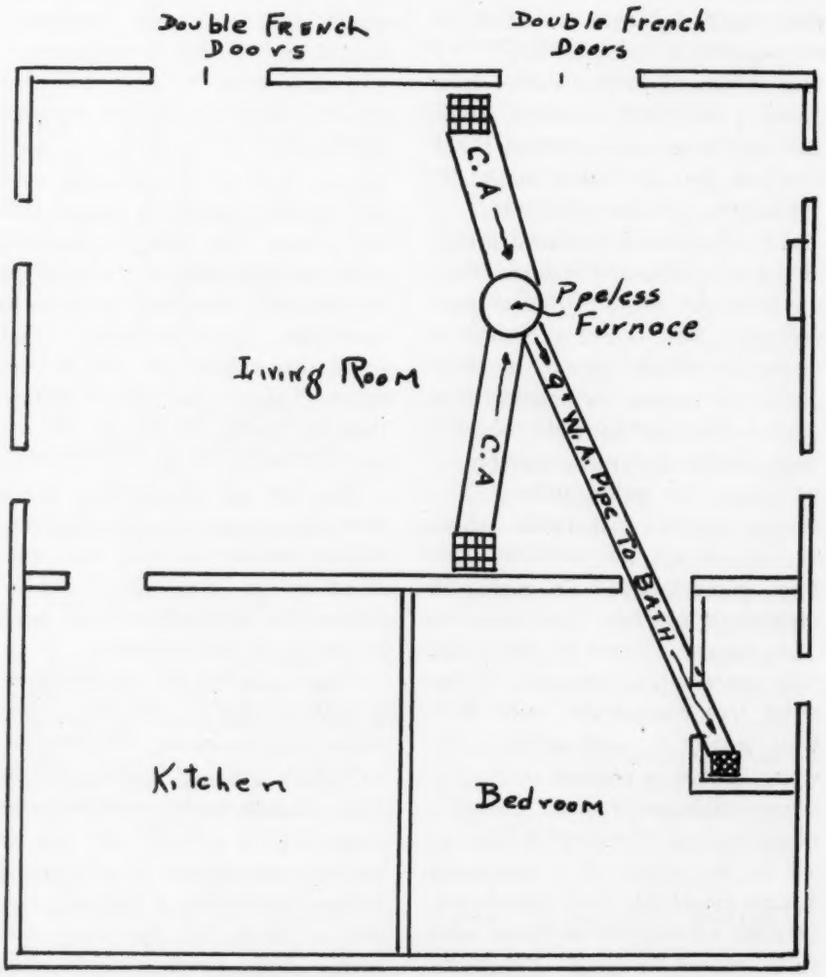
. . . the problem corner

MORE HEAT ROBBERS

ON page 21 of the November 9 issue, we presented a problem from a reader who was called in to heat a bathroom closed off and quite a distance from the pipeless furnace used in the house.

This reader's first solution was to run a single leader to this bath —but this leader did not furnish enough heat. The second attempt was made with a heat robber on the leader. The drawings show how this system now stands. The robber used is a flat cone, 18 inches in diameter, hung about 2 inches above the radiator and located to one side of the bonnet. This second solution is not satisfactory, either.

From the replies bringing solutions it is evident that the trouble lies in the robber and not in the idea. Here are some of the latest solutions received in time to get the illustrations made.



This plan shows how the system is in now. The details below show the bath supply and the robber added later. Still the bath is cold.

W. H. Clinger, Delphos, Ohio

Another advocate of a cone robber is W. H. Clinger of Delphos, Ohio. He says:

"I have been a reader of AMERICAN ARTISAN for a long time and I have gotten a lot of good stuff from it. I see in the November 9 issue that a reader wants some suggestions on a pipeless furnace heat robber. I have installed many such robbers for bathrooms or rooms removed from the furnace and all of them work. I have forced air for distances as great as 35 feet with the type of cone I use.

"There is only one simple way to do this. If the furnace has a horse shoe radiator or a round radiator make a cone of some light iron. The cone should have a diameter large enough to completely cover the space between the radiator and the casting. On a 24-inch furnace this would be a 24-inch diameter cone.

"This cone must fit tight down on the radiator. If it is raised so much as ¼ or ½ inch the rush of air through the large top register of the pipeless furnace will reverse the flow through the bathroom leader.

"I usually take the inside casing pipe off the top of the cone and straight out through the casing."

A Reader from Wenatchee, Washington

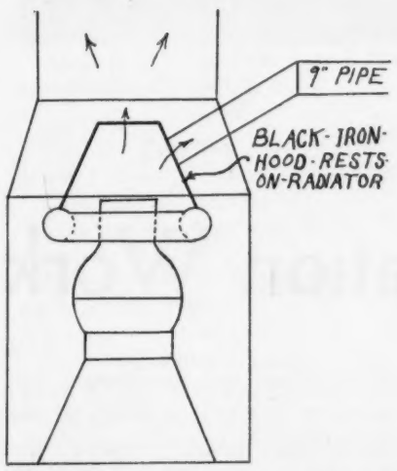
A reader from Wenatchee, Washington, who asks that his name be omitted, sends a sketch for a cone very much like others published except that the top is cut off and the leader taken out

of the side pretty well down toward the radiator. He says:

"I have had some experience in pipe work of this kind and would like to make several suggestions.

"The friction in the warm air pipe is greater than the force of the air circulating in the furnace casing. This friction must be overcome before warm air will circulate in the 9-inch pipe. Starting at the furnace to reduce this friction we can eliminate one square elbow and one angle. If possible move register to opposite corner of bath.

"Bath is remote from cold air intake and to increase air flow install 10-inch cold air return. This overcomes the affect of a



This is the robber recommended by the reader from Wenatchee, Washington.

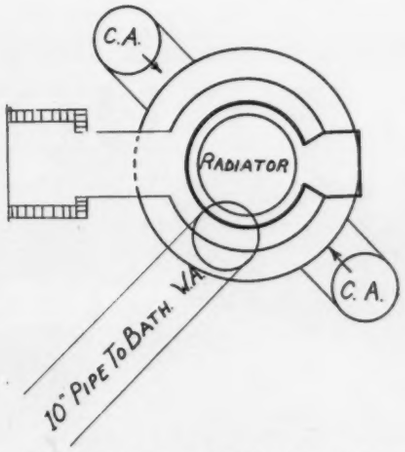
cold air blanket over the warm air register. Run cold air pipe to furnace, not to cold air duct.

"To increase the force of warm air in pipe install hood as shown in drawing. This is used if furnace is cast and of round radiator type. If steel furnace use an oblong hood between radiator and body."

C. H. Carpenter, Highmore, S.D.

C. H. Carpenter, who lives in Highmore, S. D., reports that he has had splendid success with a robber which he developed for a pipeless furnace. He also suggests some changes which ought to improve the system. Here is what he recommends:

"First you should use a 10-inch pipe as the leader to the bathroom is quite long. The 'thief' elbow should also be 10 inches with a 4-inch collar attached to the end to increase the area pre-



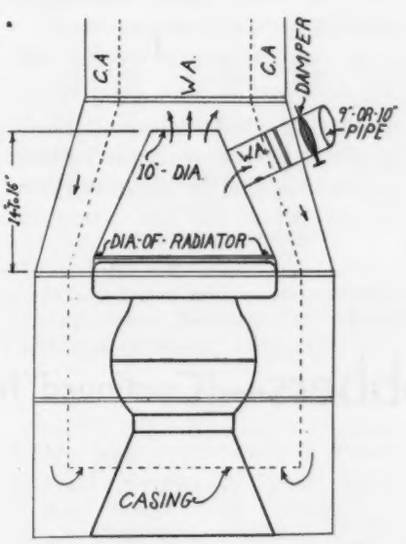
This is the type of robber used by C. H. Carpenter.

sented to the rising column of warm air. This collar should be suspended directly over the opening between the radiator and the combustion chamber whether the furnace is top radiator or steel.

"If the furnace is a straight pipeless cover the pipe where it goes through the cold air passage as an unprotected pipe will cause a slowing down in air movement inside the pipe. Air cell asbestos should be used. In some cases it will be necessary to place the bathroom register in the side wall, say about 5 feet above the floor. This location requires a riser stack which serves as a chimney to draw warm air from the long and nearly flat leader."

F. S. Matuska, Cheyenne, Wyo.

Here are some suggestions from a reader, F. C. Matuska,



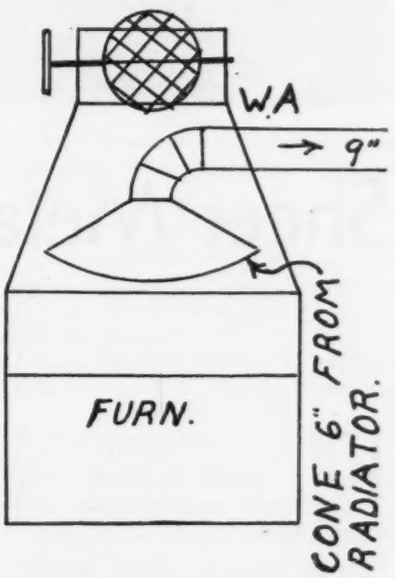
F. S. Matuska of Cheyenne, Wyoming, suggests a robber of unusual design like this. It is really a casing inside a casing. He says it works.

who writes from Cheyenne, Wyoming. He suggests:

"I see in your November 9 issue a reader wants suggestions for heating a bathroom off a pipeless furnace. I am sending a sketch showing how we install these robbers here. The method has proved very successful.

"We make a cone which is large enough to fit around the outside edge of the top radiator. The cone can be made smaller so that it will stand on the radiator, but we like the complete cover type.

"The tip of the cone should be cut off so that there is a flat area



W. E. Merwarth of Easton, Penna., recommends a unit which combines both robber cone above the radiator and a large damper for the pipeless, like this. The robber pipe also has a damper. One is shut when the other is open.

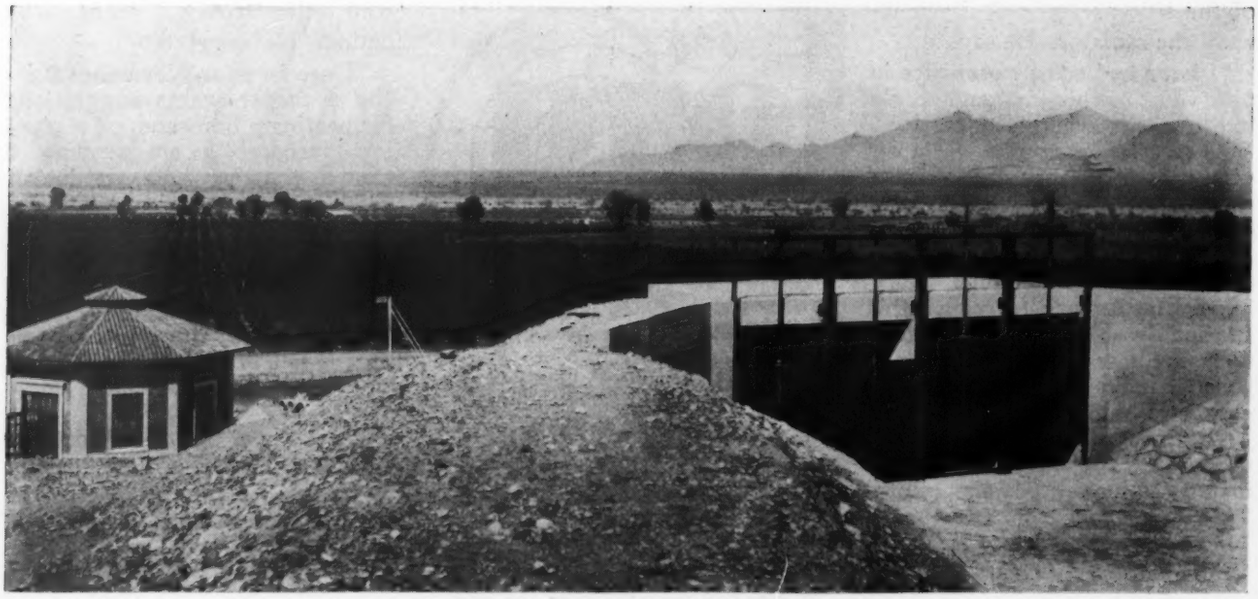
of about 10 inches diameter. This top is riveted or double seamed into the cone. The cone should be sloped so that the top of the cone comes just a few inches below the square outside casing or neck of the furnace.

"The leader is taken off at the top or just below the top of the cone so that the pipe is given a small rise as it leaves the furnace.

"By using a 10-inch pipe and a double wall box another room can be heated with this bathroom. If two robbers are taken off the cone, a metal dividing sheet should be placed to separate the inside into two equal parts. This gives each run equal heat.

"Out here we often place the pipeless furnace under a partition so that the register is cut in two

(Continued on page 26)



Sheet Metal Is Finding a Place in Irrigation Work

By **A. B. LAING**
Phoenix, Arizona

FOR many years cast iron has been considered the best material to be used wherever water was to be enclosed, as in great irrigation projects. Down south it has been found, however, that sheet metal is more desirable for the sluice gates of irrigating canals, and is replacing cast iron for this purpose in many instances.

Floating logs or other debris which might crack a cast iron gate will inflict little, if any, damage on a gate constructed of sheet metal.

Furthermore, such gates are cheaper since they can be constructed by any local sheet metal workers equipped to do heavy metal work. A casting, on the other hand, would generally have to be specially made and shipped from a distance, for, in most great agricultural areas, there are few foundries.

In every irrigation project there are hundreds of such gates similar to the one illustrated. This photograph is unique in that it portrays a new irrigation development immediately before the first water was to be turned into the system. The water in this case is lifted 60 feet from the canal (center) and pumped up through sheet metal conduits to the new canal (right) from whence it flows by gravity past the various ranches. Smaller lateral canals at intervals lead from this main stream and water is let into them by similar sheet metal gates.

The gates shown in the picture were constructed by the Western Pipe and Steel Co. of Phoenix from ¼-in. plate, the frames for same being made up from angle iron.

Heat Robbers—[Continued from Page 25]

by the partition. We then run a robber to the bathroom or any room removed from the register. This makes a cheap heating system, but one which is satisfactory in a small one-story house."
W. E. Merwarth, Easton, Penna.

From Easton, Penna., comes a short explanation and a sketch from W. E. Merwarth. He suggests:

"Put a damper in the register just below the register face. This damper can be regulated as desired until the bathroom gets the amount of heat desired. The sketch shows how I put these dampers in. The cone on the end of the robber should be moved over to a point directly above the center of the radiator and lowered until it is not more than 6 inches above the radiator."

CAN YOU TELL ME ?

"Hero" Furnace

From W. H. Kruse, Coeur d'Alene, Idaho.

Who manufactures the "Hero" furnace?

Ans.—Standard Foundry & Furnace Company, DeKalb, Illinois.

Steel Row Boat Patterns

From L. R. Wise, Chicago, Illinois.

Where can I get steel row boat patterns?

Ans.—H. F. Thompson Boat & Pattern Works, Decorah, Iowa.

Furnace Fan

From Chicago Furnace Supply Company, Chicago, Illinois.

Who makes a fan that fits in the top of the furnace?

Ans.—The A. H. Robinson Company, Massillon, Ohio.

Chimney Cleaner

From E. C. Stocker, Columbia, South Carolina.

Who manufactures a preparation for cleaning chimneys?

Ans.—Healy-Ruff Company, 797 Hampden Avenue, St. Paul, Minnesota.

Prison Cells

From Frederick H. Lord, Belle Haven, Virginia.

Where can I get prison cells knocked down and in tiers?

Ans.—American Fence Construction Company, 552 Fifth Avenue, New York City; Fries & Son Steel Construction & Engineering Company, Inc., Second and Madison Avenues, Covington, Kentucky; The Stewart Iron Works Company, 700 Stewart Block, Cincinnati, Ohio.

Ball Bearings

From Shaw Sheet Metal Works, Nampa, Idaho.

Where can we get ball bearings for 1-inch shafting?

Ans.—The Fafnir Bearing Company, 39 South Clinton Street, Chicago, Illinois; Strom Bearing Company, Div. Martin - Rockwell Corporation, 4535 Palmer Street, Chicago, Illinois; The Torrington Company, Excelsior and Standard Plant, Torrington, Connecticut.

Water Evaporating Pans

From L. M. Studevant, Sidney, Ohio.

Who manufactures water evaporating pans suitable for installation on hot water radiators?

Ans.—The George W. Diener Manufacturing Company, 400 Monticello Avenue, Chicago, Illinois.

Furnace Repairs

From C. W. Hubertz, Corry, Pennsylvania.

From what firms can I purchase furnace repairs?

Ans.—A. G. Brauer Supply Company, 314-318 North Third Street, St. Louis, Missouri; Northwestern Stove Repair Company, 662 West Roosevelt Road, Chicago, Illinois; Peerless Foundry Company, 1845-1935 Ludlow Avenue, Indianapolis, Indiana.

Aquariums

From Peter Kunold, Aurora, Illinois.

Where can I get aquariums?

Ans.—Cambridge Glass Company, Cambridge, Ohio; Cincinnati Artistic Wrought Iron Works, 2941 Eastern Avenue, Cincinnati, Ohio; Hans Jensen Manufacturing Company, 222 North Bank Drive, Chicago, Illinois.

"V" Type Pulleys

From Shaw Sheet Metal Works, Nampa, Idaho.

Where can we get "V" type pulleys and belts for same?

Ans.—The American Pulley Company, 114-116 South Clinton Street, Chicago, Illinois; The Delta Manufacturing Company, 1661 Holton Street, Milwaukee, Wisconsin.

Aquarium Cement

From Peter Kunold, Aurora, Illinois.

Where can I get aquarium cement?

Ans.—Wm. Connors Paint Manufacturing Company, Troy, New York.

Bar Steel

From C. O. Anderson, Ironwood, Michigan.

Where can I get bar steel?

Ans.—Inland Steel Company, 33 South Clark Street, Chicago, Illinois; Republic Steel Corporation, Youngstown, Ohio; Jos. T. Ryerson & Son, Inc., 16th and Rockwell Streets, Chicago, Illinois.

The W. Bingham Company

From C. O. Anderson, Ironwood, Michigan.

Where is the W. Bingham Company located?

Ans.—1278 West 9th Street, Cleveland, Ohio.

"Copper-Clad" Range

From J. V. Patten Company, Sycamore, Illinois.

Who makes the "Copper-Clad" range?

Ans.—Copper-Clad Malleable Range Company, Wainwright Building, St. Louis, Missouri.

"Wagner" Fan

From Hubertz Heating & Roofing Shop, Corry, Pennsylvania.

Who makes the "Wagner" fan?

Ans.—Wagner Electric Corporation, 6400 Plymouth, St. Louis, Missouri.

"Pioneer" Thermostat

From Hubertz Heating & Roofing Shop, Corry, Pennsylvania.

Who makes the "Pioneer" thermostat?

Ans.—Pioneer Heat Regulator Corporation, Dayton, Ohio.

Incinerators

From Highland Park Sheet Metal Works, Highland Park, Illinois.

Where can we get an incinerator that will burn paper and scraps from children's lunches?

Ans.—Economy Incinerator Company, 228 North LaSalle Street; Kerner Incinerator Company, 612 North Michigan Avenue; Mid-West Incinerator Company, 154 Erie Street; all of Chicago. Genico Incinerator Company, Alliance, Ohio.

Sheet Steel Trade Extension Committee

From Northern Metal & Roofing Company, Green Bay, Wisconsin.

Where is the Sheet Steel Trade Extension Committee located?

Ans.—The Sheet Steel Trade Extension Committee is now known as the National Association of Flat Rolled Steel Manufacturers, with headquarters in the Terminal Tower, Cleveland, Ohio.

ASSOCIATION ACTIVITIES

Cleveland Organizes Committee of Ten Group

Under the leadership of H. L. Findlay, vice-president of the Y. & O. Coal Co., and Henry M. Brown, of the stoker division of the Pocahontas Fuel Co., preliminary steps have been taken for organization of a Cleveland group of coal and related equipment interests to co-operate with the Committee of Ten.

A tentative organization, with Mr. Findlay as chairman and Mr. Brown as vice-chairman and secretary, was effected at a meeting.

The organization committee designated at the meeting includes Mr. Findlay, chairman; Mr. Brown, vice-chairman and secretary; B. Y. Kinzey, manager of the Heating and Piping Contractors' Cleveland Association; H. S. Sharp, vice-president of the Henry Foundry & Furnace Co.; O. F. Wilkinson, of the City Ice & Fuel Co.; Whitney Warner, of W. H. Warner & Co., and Wirt Griggs, branch manager of the Minneapolis-Honeywell Regulator Company.

Indiana Announces Details of 1932 Convention

The Indiana State Convention is set for the Hotel Antlers in Indianapolis on January 19-20-21. The facilities at the Antlers are exceptionally good as they can throw their ballroom and main dining room together, and this, in conjunction with the fact that room and meals are obtainable at the same place, makes it possible to have all the convention activities at one point.

As has been the custom of the Indiana Contractors' Association and the Furmets, the convention will be a joint meeting of the two organizations. The ballroom will be used for an exhibit floor with the main dining room adjoining available for meetings and luncheons.

1932 Sheet Metal Convention Program

Something different in annual conventions of the roofing, sheet metal and slate trades is promised by the program of the first annual joint conference of the roofing trades, to be held at Louisville, Ky., the week of January 25, 1932.

First comes the Monday Fellowship Luncheon, which takes in the exhibitors as well as all the members and guests. Then follow four days of activity in the way of discussions and conferences and round table sessions such as never before have been known in these trades. Every phase of the subject of business efficiency and success will be brought up and discussed thoroughly and intelligently.

At the head of the program are two men prominent in the industrial world who will address the conference. Robert D. Kohn, of New York, president of the American Institute of Architects, will speak on "How the Roofing and Sheet Metal Trades Can Improve Their Service to Architects and Owners."

On Thursday, E. St. Elmo Lewis will conduct an open forum on "How Are You Going to Make More Money in 1932?"

Present at the Tuesday Fellowship Luncheon will be the governor of Kentucky, mayor of Louisville and other honored guests. The address will be by Thomas Nolan, architect, president of the Louisville Building Congress.

Armco Distributors Elect Officers

Quincy W. Wales, Brown-Wales Company, Boston, was again re-elected president of the Armco Distributors' Association, at their eighth annual convention held in Middletown on December 9 and 10. A. J. Luedke, Milcor

Steel Company, Milwaukee, was re-elected vice-president, while Bruce Haines, Hammond Sheet Metal Co., St. Louis, was elected secretary-treasurer.

Charles R. Hook, president of the American Rolling Mill Co., spoke on the subject "Business Conditions as I See Them."

A. H. Larsen and T. L. Marshall, sales promotion managers of the Plymouth Motor Corporation, dramatized the successful sales promotion program developed to promote the sale of the new Plymouth car. Bruce Barton, whose journalistic fame has spread far beyond the borders of the United States, was the guest speaker at the banquet held on the evening of December 9.

Jack Stowell, sheet metal contractor of Aurora, Illinois, introduced many points of mutual interest in an address entitled "The Sheet Metal Contractor's Merchandising Problems."

The concluding address of the conference was made by Bennett Chapple, Sr., vice-president of Armco. It was entitled "Marching On," and he pointed out that many new products have been created as a result of research.

Indiana Sheet Metal and Warm Air Heating Contractors' Association — January 19, 20, 21, 1932, at Hotel Antlers, Indianapolis, Ind. Secretary, Paul R. Jordan, 631 South Delaware Ave., Indianapolis.

American Society of Heating and Ventilating Engineers—January 25-28, 1932, at Cleveland, Ohio. Secretary, A. V. Hutchinson, 51 Madison Avenue, New York City.

National Association Sheet Metal Contractors, United Roofing Contractors, Roofing Division of National Slate Association — January 25-28, at Brown Hotel, Louisville, Kentucky. W. C. Markle, secretary-treasurer, 1604 Law and Finance Building, Pittsburgh, Penna.

International Heating and Ventilating Exposition—January 25-29, 1932, at Cleveland Auditorium, Cleveland, Ohio. Manager, Charles F. Roth, International Exposition Company, Grand Central Palace, New York City.

American Society of Refrigeration Engineers—January 25-29, 1932, at Hotel Cleveland, Cleveland, Ohio. Secretary, David L. Fiske, 37 West 39th Street, New York City.

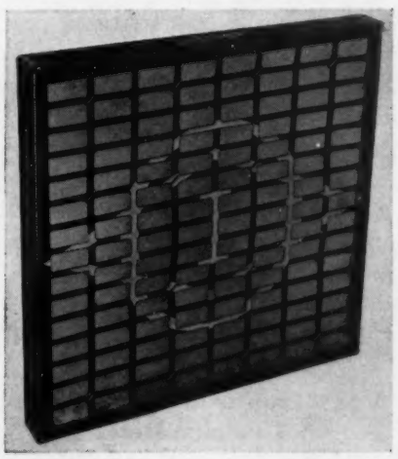
Sheet Metal Contractors' Association of Wisconsin — February 1-2, New Pfister Hotel, Milwaukee, Wisconsin. Paul L. Biersach, Secretary, 418 Metropolitan Block, Milwaukee, Wis.

News PRODUCTS

Owens-Illinois Glass Co. Announces "Dustop"

The Owens-Illinois Glass Company, Toledo, O., glass manufacturers, announce a new product—an air filter of glass wool.

This new product which will bear the trade name of "Dustop" will be offered as a complete, self-contained



air filter unit, in which the scientifically treated "glass wool" serves as the filtering medium.

"Dustop" is said to be extremely simple of design and so low in price as to make feasible the replacement of the complete unit when dirty. The container is of paper, which adds to the lightness of the unit and renders it readily disposable. While it weighs but two pounds, it is claimed to absorb dust in excess of its own weight. The "flexibility" of the paper container establishes a tight seal between the filter and the metal frame into which it fits, thus preventing the passage of any unfiltered air around the unit. The container has been designed 2 inches in thickness, so that when a standard 4-inch pack is established by using two units in tandem, or two units placed face to face, it is only necessary to change one-half the thickness of the total pack at one time.

✦

American Brass Co. Will Exhibit at Louisville

The American Brass Company announces that its exhibit will occupy spaces 10 and 11 at the Roofing and Sheet Metal Conference, to be held January 25 to 29, at The Brown Hotel, Louisville, Kentucky.

The display will comprise Anaconda Sheet Copper in sheets, rolls and Economy strips for roofs, flashings, rain-pipes, leaders and gutters, etc. Chimney flashings will be shown in packages.

Two features of the exhibit will be stamped sheet metal spandrels of Cold Rolled Copper, Everdur Metal and Lead Coated Copper; and Everdur Metal for ventilating equipment. Corrosion resistant ventilating equipment of Everdur will include ducts, ventilators and shapes for louvers and other sections.

Everdur roofing nails for slate and other shingles will be part of the display.

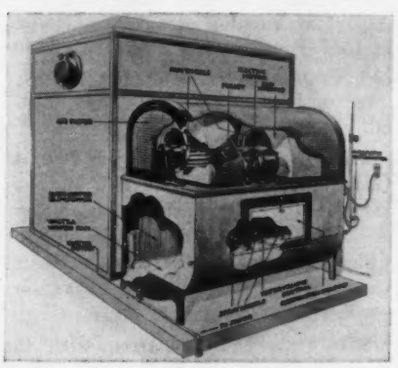
W. Harold Dowd, exhibit manager, will have charge.

✦

Holland Introduces Air Conditioning Unit

Announcement is made by the Holland Furnace Company of a moderate cost air conditioning unit.

The Holland conditioner is an auxiliary unit in the form of a compact sheet metal cabinet for attachment immediately to the rear of the casing of a warm-air heater. It occupies less than 10 square feet of space and is about 40 inches high. In addition to



the cabinet itself, the conditioner consists of four principal parts; namely, a semi-cylindrical copper mesh filter over the top of the cabinet; a high-speed, twin squirrel cage type fan unit with a ¼-h.p. motor between the fans and, within the cabinet a series of spray nozzles that emit fine, swirling, water sprays, and a reversible eliminator.

The fans, with capacity for moving 1,500 to 2,000 cubic feet of air per minute, draw the basement air through the filter and force it through the water sprays. The water sprays impinge against an eliminator of "Z" plate construction. The washed air then passes into the heating plenum and into the rooms of the house. In conjunction with the washing-cooling process, the unit may be installed as to permit the utilization of the cool air of the basement for cooling purposes. The operation of the fans and the water sprays is under thermostatic control.

✦

Bryant Will Sell Griswold Circulating Heater

The Bryant Heater & Mfg. Company, Cleveland, has taken over the sale of the Griswold "Two-in-one" gas-fired Circulating Heater, manufactured by the W. A. Griswold Company, Nashville, Tennessee.

The Bryant company has contracted for the entire output of the Griswold factory and secured exclusive sales rights for the entire United States. Distribution will be handled through Bryant's 48 branch offices.

The present line of heaters consists of three sizes with input ratings ranging from 30,000 to 70,000 B.t.u. per hour.

The Griswold Circulating Heater is said to combine the accepted features of the radiant type of heater with those of the circulating type. Exposed radiants in the front of the cabinet supply direct radiated heat. Within the cabinet is the all cast iron inner circulating unit up through which the air to be heated passes. One of the important features of this heater is its ability to circulate a large volume of low temperature air. Built-in humidifiers supply moisture to the warmed air.

Other notable features include finned air flues, which more than double the heating surface, and baffles which require the hot gases completely to surround the air flues several times before reaching the vent.

All three models have been approved by the A. G. A. Laboratory.

Williams Oil-O-Matic Reports Profitable Year

The old surgical adage, "a deep cut for a sore finger," applied judiciously to modern business, produces quick convalescence—is contended by the Williams Oil-O-Matic Heating Corporation of Bloomington, Ill.

The surgery consisted of the removal of every source of inefficiency in factory, office and selling organizations. The immediate result of this has been sensationally lower prices and the development and introduction of Hushed Heat—a term coined to describe the result of the basic improvements in the oil burner.

"The new business outlook for the year 1932 is very encouraging," commented Mr. Williams, in discussing his organization's favorable showing. "There was never a period in our history when the public was more 'automatic heat and cold minded'."

✦

Automatic Cut-Off for Roll Forming Machines

A new automatic cut-off feature which may be either built into the machine or supplied as a separate unit has been introduced by the McKinney Tool & Mfg. Company, Cleveland, Ohio, makers of Roll-Forming Machines for mouldings, tubing and similar sections.

The new device works automatically, making it possible to cut the moulding or section to any desired length at the same speed it is being formed without stopping the machine or altering its speed.

One type is designed for cutting the stock in the flat before it enters the forming rolls. This type of machine consists of a flying shear working with an automatic trip, which cuts the material as it passes through a series of punch rolls before entering the forming rolls.

The other type of cut-off is located at the exit end of the roll-forming machine. This machine is made to operate in two different ways. On mouldings which are open and can be cut conveniently by the use of a shear, the shearing method is employed.

✦

Dail Steel Products Company Issues New Engineering Sheet

Dail Steel Products Company, Lansing, Michigan, have sent us a new engineering sheet which is being issued to their trade. The new sheet is a three fold leaflet containing on its pages all the charts, tables and explanation necessary to fill in the data sheet which occupies two inside pages.

The data sheet contains the usual spaces for filling in exposure percentages, space for the notation of building construction, and columns for 16 rooms. Down the left edge there is carried spaces for filling in all measurements and data necessary to calculate the requirements of the house.

A large scale friction chart carrying friction in 1/100 inch of water gauge per 100 feet and showing pipe sizes below 4-inch and up to 50 inches is given on one page. This is an excellent chart for residential work.

Another page chart shows circular equivalents of rectangular ducts for total friction for pipe sizes from 3 inches to 50 inches for depth and from 5 inches to 66 inches for width.

Two pages are devoted to explanation of how to use the sheet. In addition these pages carry abbreviated tables of heat transmission coefficients and a full description of how to list each item.

This chart should be of value to any contractor wanting a data sheet for calculating forced work in residences.

Copies may be had from the company.

CALIFORNIA LICENSE LAW

(Continued from page 23)

which are specified.

At the present time, practically anyone who wishes to pay five dollars may obtain a license. There are no restrictions to the amounts or kinds of work which he may undertake, nor must he satisfy anyone except possibly the owner or the general contractor that he is competent. Prequalification is not yet required. Contractors' associations and other bodies hope that future legislation will demand that before a contractor be licensed, he give some indication of his right for a license. Furthermore, future licenses probably will restrict a contractor to take work only up to amounts that he is financially able to handle.

Contractors are agreed that California's experiment is on the whole a successful one. Other western states are planning the adoption of similar licensing laws.

Personals . . .

American Foundry & Furnace Co. Opens Chicago Office

The Gas Division of the American Foundry & Furnace Co., Bloomington, Ill., manufacturers of the American gas-fired June-Aire and the American gravity gas furnace, announced recently the opening of a Chicago office at 1025 Peoples Gas Bldg., 122 South Michigan Avenue, under the management of Barney Olson and Ray Clewell.

Mr. Olson started with the Peoples Gas Light & Coke Co. in 1902 and was associated with them in various capacities until 1922 when he joined the Chicago office of the Bryant Heater Co. He resigned from the Bryant organization September 15, 1931.

Mr. Clewell also started with the Peoples Gas Light & Coke Co., after graduating from the University of Illinois in 1923. He was later with the C. A. Dunham Co., as a member of their St. Louis sales force. He entered the Chicago organization of the Bryant Heater Co. in 1927, resigning September 15, 1931.

A. W. Johnson of Excelsior Furnace Dies

"A. H." (Arthur Henry) Johnson, 6416 Forbes Street, Pittsburgh, Pa., passed away suddenly at age of sixty-eight years on Thursday, December 17th.

Mr. Johnson was well and favorably known in his community and state, having been engaged in the warm air furnace business in Pittsburgh since 1890. His acquaintance was broad. His experience in furnace heating was first as salesman, later as installer and for the past twenty years as manager of Pittsburgh branch of The Excelsior Steel Furnace Co., Chicago.

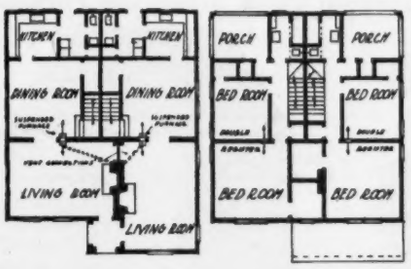
Mr. Johnson's sons, Arthur and William, will carry on the business at 238-240 First Avenue, Pittsburgh.

✦

Kleenaire Filter Co. Appoints Eastern Manager

Kleenaire Filter Co., Stevens Point, Wis., announces the appointment of R. C. Chelius as Eastern Representative, with headquarters at 31 Palmer Avenue, Kenmore, N. Y. Mr. Chelius will call on dealers, jobbers and manufacturers, and is well fitted to help solve their air filtering problems. Mr. Chelius will be a direct factory representative.

And Now **UNIT HEATING** *for Buildings Without a Basement!*



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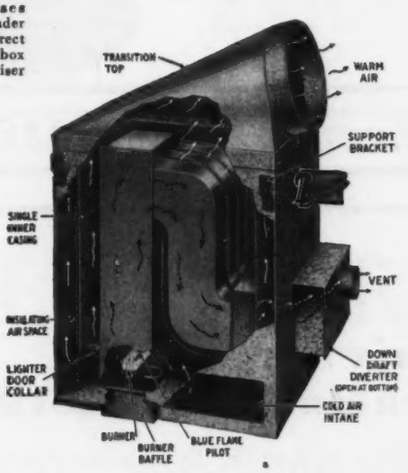
The New PAYNE SUSPENDED FURNACE

Used With or Without Cold Air Return

Eliminates heat losses common to large leader pipes. Connects direct to first floor register box or second floor riser through a boot.



Eliminates expense of excavating for basement and long leader pipes to rooms. Hangs from floor joists under the house. Ideal for two-story duplexes and unit heating plan in multiple dwellings. Provides an ever-changing room atmosphere, heated to the exact degree desired and controlled instantly by electric switch or thermostat.

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Gives complete description of construction and equipment. Also a variety of typical plans where Payne Suspended Furnaces solve the heating problem.

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HESS AUTOMATIC FURNACE

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The Hess Automatic Furnace with one-piece inner body never leaks dirt, gas or smoke. It is furnished complete with accessories shown for little more than an ordinary furnace of the same capacity, and made in two sizes to cover a large share of your furnace jobs. Here is a furnace you can feature and sell at a good profit. No extras to buy.

The Hess Airwater Unit is designed for use with any make of furnace in homes of average size. It washes, purifies, humidifies and forces the air circulation for greater health, comfort and economy, both winter and summer. The unit comes completely assembled ready for connection to the furnace system. Right now when furnace sales are slow you will find the Hess Airwater Unit just the thing to modernize existing furnace installations.

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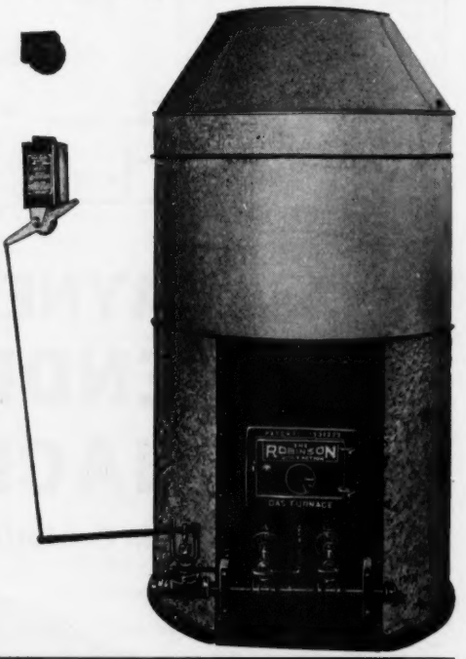
Robinson Quick Action Gas Furnace



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Up to and including 50,000 cu. ft. gross content	$0.12 per 1,000 cu. ft.
50,000 cu. ft. and over	$0.10 per cu. ft.

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50,000 to 70,000 cu. ft.	$0.25 per 1,000 cu. ft.
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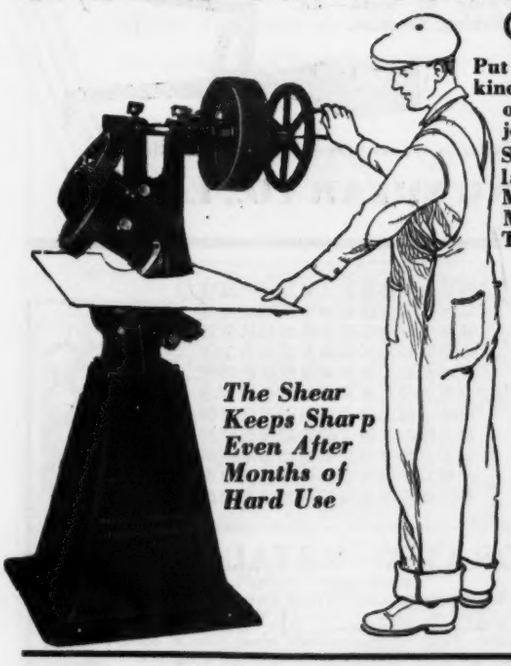

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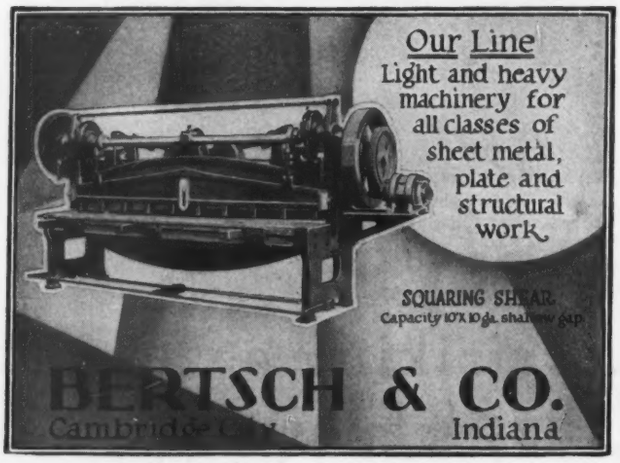
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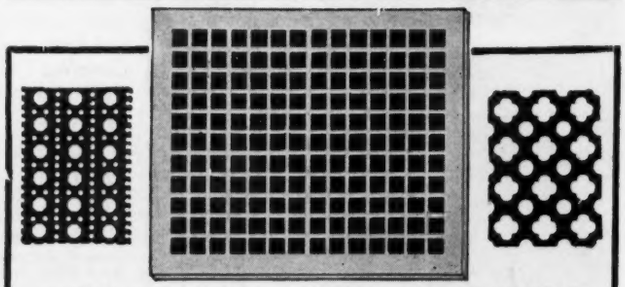

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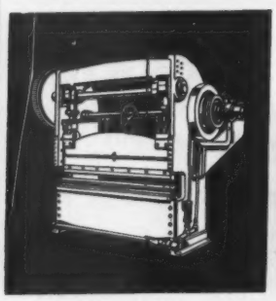

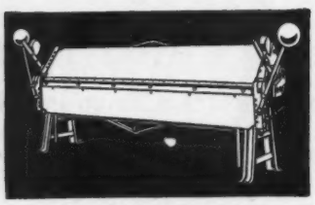

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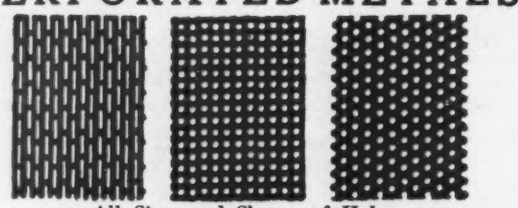

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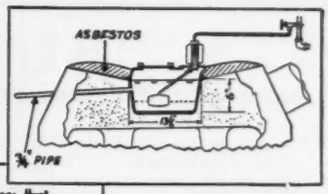

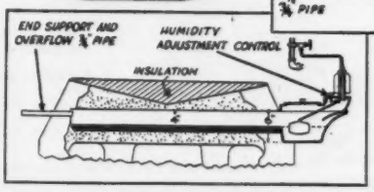

Diagram just above shows the simple manner in which the round model is installed in the bonnet of the furnace.

Diagram at the left indicates simple method of installing the long model.

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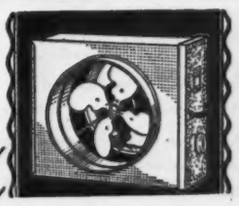

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Heaters—School Room

Meyer Furnace Co., The, Peoria, Ill.
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steel Products Co., Duluth, Minn.

Humidifiers

Automatic Humidifier Co., Cedar Falls, Iowa
Clarm Mechanical Devices Co., Lima, Ohio
Columbus Humidifier Co., Columbus, Ohio
Diener Mfg. Co., G. W., Chicago, Ill.
Hess Warming & Vent. Co., Chicago, Ill
Menominee Air Washer Co., Menominee, Mich.
Meyer & Bro. Co., F., Peoria, Ill.
Sallada Mfg. Co., Minneapolis, Minn.

Humidifier Valves

Apex Regulator Co., Marshalltown, Iowa

Machinery—Culvert

Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Machinery—Rebuilt

Interstate Machinery Co., Chicago, Ill.

Machines and Tools—Tinsmith's

Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Niagara Mach. & Tool Wks., Buffalo, N. Y.
J. M. & L. A. Osborn Co., Cleveland, Ohio
Parker-Kalon Corp., New York, N. Y.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.
Yoder Co., The, Cleveland, Ohio

Metal Lath—Expanded

Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Miters

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

(Continued on page 38)

HEALTH AIR

Warms in Winter—Cools in Summer

BLOWERS AIR WASHERS

Low Priced *Efficient*

GET OUR PROPOSITION

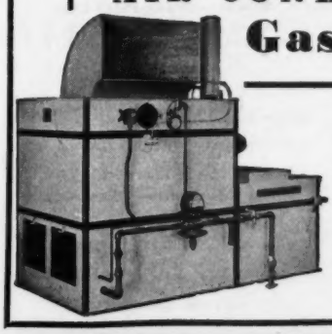
HEALTH-AIR SYSTEMS

1105 North Main St. Ann Arbor, Mich.

MONCRIEF

AIR CONDITIONING

Gas Furnace



A completely equipped unit for the home. Full Automatic. A profit making proposition for dealers.

Write for Particulars

THE HENRY FURNACE & FOUNDRY CO.

3471 East 49th St.

Cleveland Ohio

"True to the Name"

FAULTLESS

WARM AIR FURNACES

Kept Modern

BY CONSTANT IMPROVEMENTS

WE believe that "out of date, out of mind" is most applicable to furnaces. That's why Faultless Furnaces are kept up-to-date . . . because it keeps them in the minds and gets them in the homes of your prospects.

THE GRAFF FURNACE CO.

SCRANTON, PENNSYLVANIA

New York City Sales Office: 116-118 Wooster Street

PREMIER

FURNACES

"Constantly Improved, Supreme in their Field" Guaranteed for 10 Years

PREMIER *De Luxe* (Cast Iron)

Write for 1931 Catalog

PREMIER *Duo-Weld* (Steel)

Order Only Genuine Agricola

REPAIR PARTS

Only genuine AGRICOLA Repair Parts assure perfect fitting castings. Prompt shipments.

AGRICOLA FURNACE CO., Inc.

Gadsden, Alabama

Offices in principal cities

"Hello, Mr. Furnace Man!"

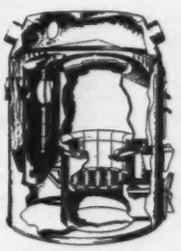
We'd like to take you through our plant and explain each operation in the production of

X-L-ALL

RUGGED STEEL

Warm Air Furnaces

(Pat. Applied For)



We'd like to point out the various features which make our furnace the outstanding heating plant of the day. We'd like to tell you the reason for constructing it as we do. We fully appreciate that your customers do not buy furnaces—but that they buy heat, ample heat, under easy control, gained efficiently. Drop in some day, but in the meantime learn more about X-L-All Furnaces. Mail this coupon today.

Remember: Total Sales for X-L-ALL Furnaces During 1931 Were Almost Twice the Volume During 1930! There Must Be a Reason.

Deshler Foundry & Machine Works
140-142 S. East Ave., Deshler, Ohio

Please send me without obligation

.....The X-L-ALL Furnace Book.

.....The X-L-ALL Dealer Proposition.

Name.....

Street.....

City.....A.A.

Say you saw it in AMERICAN ARTISAN—Thank you!

BUYERS' DIRECTORY

(Continued from page 36)

Nails—Hardened Masonry
Parker-Kalon Corp., New York, N. Y.

Paint
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Patterns—Boat
H. J. Thompson Boat & Pattern Wks., Decorah, Iowa

Perforated Metals
Chicago Perforating Co., Chicago
Harrington & King Perforating Co., Chicago, Ill.

Pipe and Fittings—Furnace
Henry Furnace & Fdy. Co., Cleveland, Ohio
Meyer & Bro., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
J. M. & L. A. Osborn Co., Cleveland, Ohio
Peerless Foundry Co., Indianapolis, Ind.

Pokers—Furnace
Fanner Mfg. Co., Cleveland, Ohio
Independent Reg. & Mfg. Co. Cleveland, Ohio

Pulleys—Furnace
Hart & Cooley Mfg. Co., Chicago, Ill.

Punches
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Parker-Kalon Corp., New York, N. Y.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
W. A. Whitney Mfg. Co., Rockford, Ill.

Punches—Combination Bench and Hand
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Parker-Kalon Corp., New York, N. Y.

Punches—Hand
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Parker-Kalon Corp., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

Putty-Stove
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Radiator Cabinets
Hart & Cooley Mfg. Co., Chicago, Ill.
Tuttle & Bailey Mfg. Co., New York

Registers—Warm Air
Auer Register Co., Cleveland, Ohio
Forest City Foundries Co., Cleveland, Ohio
Hart & Cooley Mfg. Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Register & Mfg. Co., Cleveland, Ohio
Meyer & Bro., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Rock Island Register Co., Rook Island, Ill.
Symonds Register Co., St. Louis, Mo.
Tuttle & Bailey Mfg. Co., New York
United States Register Co., Battle Creek, Mich.
Waterloo Register Co., Waterloo, Ia.; L. A., Cal.; Seattle, W.

Registers—Wood
American Wood Register Co., Plymouth, Ind.
Auer Register Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Regulators—Automatic Furnace
Hart & Cooley Mfg. Co., Chicago, Ill.
Lakeside Co., Hermansville, Mich.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modern Heat Regulator Co., Cleveland, Ohio
Tuttle & Bailey Mfg. Co., New York
White Mfg. Co., Minneapolis, Minn.

Regulators—Automatic Heat
Hart & Cooley Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modern Heat Regulator Co., Cleveland, Ohio
Tuttle & Bailey Mfg. Co., New York
White Mfg. Co., Minneapolis, Minn.

Repairs—Stove and Furnace
Brauer Supply Co., A. G., St. Louis, Mo.
Des Moines Stove Repair Co., Des Moines, Iowa
Northwestern Stove Repair Co., Chicago, Ill.
Peerless Fdry. Co., Indianapolis, Ind.

Solder—Rosin Core
Kester Solder Co., Chicago, Ill.

Ridging
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Rings—Furnace Casing
Forest City Foundries Co., Cleveland, Ohio

Roof Flashing
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Roof Paints
Connors Paint Mfg. Co., Wm.,
Lastik Products Corp., Pittsburgh, Pa.

Roofing—Iron and Steel
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., The, Newport, Ky.
Republic Steel Corp., Youngstown, Ohio

Roofing—Tin and Terne
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Republic Steel Corp., Youngstown, Ohio

Rubbish Burners
Hart & Cooley Mfg. Co., Chicago, Ill.

School—Sheet Metal Pattern Drafting
St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating
St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Parker-Kalon Corp., New York

Screens—Perforated Metal
Chicago Perforating Co., Chicago, Ill.
Harrington & King Perforating Co., Chicago, Ill.

Scuppers
Aeolus Dickinson, Chicago, Ill

Shears—Hand and Power
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Viking Shear Co., Erie, Pa.
Yoder Co., The, Cleveland, Ohio

Sheet Metal Screws—Hardened, Self-Tapping
Parker-Kalon Corp., New York

Sheets—Alloy
Inland Steel Co., Chicago, Ill.
International Nickel Co., New York, N. Y.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, Ohio

Sheets—Aluminum
J. M. & L. A. Osborn Co., Cleveland, Ohio

Sheets—Black and Galvanized
American Rolling Mill Co., Middletown, Ohio
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., Newport, Ky.
J. M. & L. A. Osborn Co., Cleveland, Ohio
Republic Steel Corp., Youngstown, Ohio

Sheets—Copper
American Brass Co., Waterbury, Conn.
Revere Copper & Brass Inc., Rome, N. Y.

Sheets—Iron
American Rolling Mill Co., Middletown, Ohio
Granite City Steel Co., Granite City, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., Newport, Ky.
J. M. & L. A. Osborn Co., Cleveland, Ohio
Republic Steel Corp., Youngstown, Ohio

Sheets—Copper Bearing Steel
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., Newport, Ky.
J. M. & L. A. Osborn Co., Cleveland, Ohio
Republic Steel Corp., Youngstown, Ohio

Sheets—Nickel
International Nickel Co., New York

Sheets—Pure Iron Copper Alloy
Newport Rolling Mill Co., Newport, Ky.

Sheets—Special Finish
American Rolling Mill Co., Middletown, Ohio
Inland Steel Co., Chicago, Ill.
Newport Rolling Mill Co., Newport, Ky.
J. M. & L. A. Osborn Co., Cleveland, Ohio
Republic Steel Corp., Youngstown, Ohio

Shingles and Tile—Metal
Globe Iron Roofing & Corrugated Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Skylights
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Snips
Peck, Stow & Wilcox Co., Southington, Conn.

Snow Guards
Berger Bros. Co., Philadelphia, Pa.
David Levow, New York, N. Y.
Rival Strap Corp., New York, N. Y.

Solder
Kester Solder Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Solder—Acid Core
Kester Solder Co., Chicago, Ill.

Solder—Self-Fluxing
Kester Solder Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Soldering Furnaces
Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Soot Destroyer
Saginaw Salt Prod. Co., Saginaw, Mich.

Specialties—Hardware
Diener Mfg. Co., G. W., Chicago, Ill.

Stars—Hard Iron Cleaning
Fanner Mfg. Co., Cleveland, Ohio

Stove Pipe and Fittings
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Stove and Furnace Trimmings
Fanner Mfg. Co., Cleveland, Ohio

Strainers—Roof
David Levow, New York, N. Y.
Rival Strap Corp., New York, N. Y.

Straps—Ornamental Pipe
David Levow, New York, N. Y.
Rival Strap Corp., New York, N. Y.

Tinplate
Granite City Steel Co., Granite City, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Republic Steel Corp., Youngstown, Ohio

Tools—Tinsmith's
(See Machines—Tinsmith's)

Torches
Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Trade Extension
Copper & Brass Research Assn., New York

Unit Air Conditioners
American Fdry. & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
Andes Range & Furnace Corp., Geneva, N. Y.
Armstrong Furnace Co., Columbus, Ohio
Dall Steel Products Co., Lansing, Mich.
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdry. Co., Cleveland, Ohio
Health-Air Systems, Ann Arbor, Mich.
Hess Warming & Ventilating Co., Chicago, Ill.
Lennox Furnace Co., Marshalltown, Iowa
May-Fieberger Co., Newark, Ohio
Meyer Furnace Co., Peoria, Ill.
Midland Furnace Co., Columbus, Ohio
Motor Wheel Corp., Lansing, Mich.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Payne Furnace & Supply Co., Beverly Hills, Calif.
Richardson & Boynton Co., New York
Rudy Furnace Co., Dowagiac, Mich.
Thatcher Furnace Co., Newark, N. J.
Waterman-Waterbury Co., Minneapolis, Minn.
Williamson Furnace Co., Cincinnati, Ohio

Vacuum Cleaners—Furnace
(See Furnace Cleaners)

Ventilators—Ceiling
Hart & Cooley Mfg. Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Reg. & Mfg. Co., Cleveland, Ohio

Ventilators—Floor
Aeolus Dickinson, Chicago, Ill.

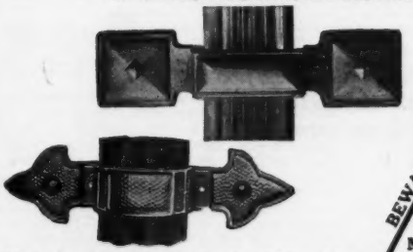
Ventilators—Roof
Aeolus Dickinson, Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Burt Mfg. Co., Akron, Ohio
Jordan & Co., Paul R., Indianapolis, Ind.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Water Pressure Regulators
Apex Regulator Co., Marshalltown, Iowa

Wood Faces—Warm Air
Auer Register Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

RIVAL STRAP CORP. 308 WEST 20th ST. NEW YORK, N. Y.

THE RIVAL AND FITRITE
One-Piece Ornamental Leader Straps
Patented July 10th, 1928; Jan. 6th, 1931



Made in six styles. Write for folder showing complete line and sizes.
STRAPS SOLD THRU JOBBERS ONLY

BEWARE OF IMITATIONS

"FITRITE"
Mop Heads & Staples
Malleable Iron
Write Dept. "A" for full details and prices

"FITRITE" SKYLIGHT GEARING

Iron or Bronze ¾"-1¼" and 1" sizes
Made also for chain operation

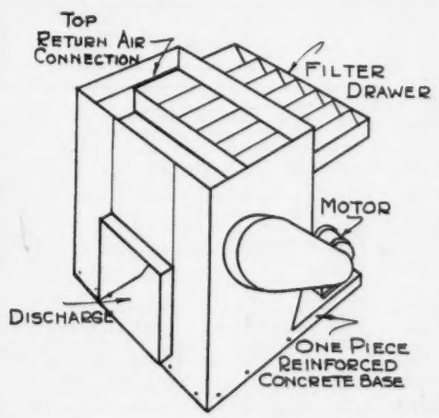
"Fitrite" Adjustable
PIPE SNOW GUARDS
Galvanized Iron or Bronze

Type "X"

"FITRITE" *Bronze*
ROOF
STRAINERS
3 Types. For Roofs having inside cast iron leader. Type "X" (illustrated) also made in Mal. Iron.

"FITRITE" *Bronze*
BEEHIVE
STRAINERS
For Round Leaders
3"-4"-5"-6"-7"-8" Diameter

DAVID LEVOW 308 WEST 20TH ST. NEW YORK



LONG LIFE AIR CLEANER and CONDITIONER

A new and silent blower and filter unit. Comes assembled ready to install. Only unit completely assembled at factory on its own foundation. Total weight only 75 pounds. Capacities up to 1800 c.f.m. at ¼" S.P. Adaptable to warm air, steam, vapor, or hot water air conditioning system. Comes attractively painted. Filter dry type in sliding drawer. S. K. F. ball bearings on fan and motor. Requires attention but once per year. Tested and approved at our factory by Platte Overton. Write today for information regarding agency, prices, terms, and window display. A business getter at a price less than blowers and filters in separate units.

THE GENERAL AIR CONDITIONING COMPANY, INC.
2755 West 31st Street Chicago, Illinois

1871–ROUND OAK–1932

A name known everywhere for—

Quality—Service
Dependability

Increase Your 1932 Profits with Round Oak Furnaces

Write us for details

ROUND OAK FURNACE CO. DOWAGIAC MICHIGAN

Keep Your Shop Busy All Winter
With the Tornado Furnace Cleaner

The Tornado Furnace Cleaner gets you into the basement where it is easy to sell furnace repairs. And you make a profit on the cleaning job too!

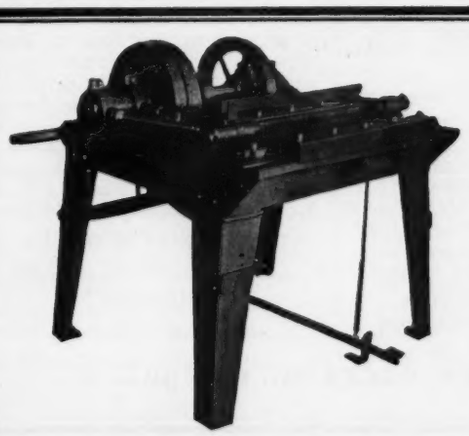
One dealer sold 150 repair jobs as a result of furnace cleaning.

Tornado is most powerful cleaner built, low in price.

Write for sales plan that tells you how to get the business

Only $149.50 Easy Terms and Free Trial

Breuer Electric Mfg. Co.
865 Blackhawk St., Chicago



Yoder L-300
Stove Pipe Seaming Machine

THIS machine is built with a combination set of 3 pairs of dies, and completely forms the edges of Stove Pipe Sheets, ready for seaming. The bed is of ample proportions, cast in one piece, including all bearings. The shafts are large and all parts sufficiently heavy to permit of rapid operation and produce accurate work.

The dies are accessible, permitting of quick and easy adjustment and are of sufficient length to seam 31" sheets, of No. 22 gauge or lighter. Curling rolls can be attached to frame of the machine, permitting seaming and curling pipe with one handling. Net weight—2700 pounds.

THE YODER COMPANY
W. 55 ST. and WALWORTH AVE. CLEVELAND, OHIO
PLATE AND SHEET METAL MACHINERY SPECIALISTS

Alphabetical List *of* Advertisers

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in alternate issues is marked with an asterisk.

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Standard Asbestos Mfg. Co.* ....

Technical Products Co.* ....
Thatcher Furnace Co.* ....
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Yoder Co., The 39
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Classified Advertising

BUSINESS CHANCES

Lightning Rods—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddle Company, Marshfield, Wis.

For Sale—Well established furnace and sheet metal shop in city of 26,000 in South Eastern Iowa. Business established 16 years ago, and has No. 1 reputation for quality work and clean stock of material on hand. Tools and stock for sale cheap. Old age and poor health reason for selling. Address Y-543, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

For Sale—Inventor wants someone to promote the manufacture and sale of device for setting furnaces. One man, without helper, can handle heaviest castings alone. Designed to take down radiator on reset jobs, without removing bonnet or pipes. Simple to manufacture. Millions of possible customers. Will sell outright or on royalty basis. Address M-543, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted — By furnace salesman, traveling Kansas, Missouri and Nebraska for the past 15 years. Thoroughly acquainted with the heating trade and the heating business. Age, 39. Photograph and best of references on request. Address G-543, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

HELP WANTED

WANTED

Experienced Furnace Salesmen. For Illinois and Indiana territories. Address J-544, AMERICAN ARTISAN.
139 North Clark Street Chicago, Ill.

Wanted—State and Territory Representatives, including Live Jobbers. Latest and finest improved welded steel warm air heaters. Advantages that the trade appreciate. Balanced heating never before reached in warm air. A selling plan that is worth while—a unit that will reach the new market. Address Z-543, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

SALESMAN WANTED

to call on and sell to dealers in Chicago area (make Cook and Will Counties, Illinois, and Lake County, Indiana) with a complete line of high grade steel furnaces for quality as well as competitive jobs, including oil and gas furnaces. Resident of Chicago preferred. Liberal commission proposition.

Address in Confidence
MEYER FURNACE CO.
Peoria, Ill.
K-544

Wanted—Experienced furnace salesmen for the territory of Illinois and Wisconsin for an old, established trade mark line of furnaces. Address G-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

HELP WANTED

Furnace manufacturer has a proposition of real interest for a good furnace salesman for Chicago and adjacent territory, to call on retail trade. Commission basis insures an aggressive man making real money. Quality steel furnace line (coal, gas and oil burning) with a wide range of prices. All replies confidential.

Address L-544
AMERICAN ARTISAN
139 North Clark St., Chicago, Ill.

Established manufacturer of steel furnaces is looking for a man to sell furnaces to dealers on straight commission basis in Central States. Positively no salary or drawing account, but liberal commissions. If you are a successful furnace salesman you can make more money on this proposition than on a salary. Address E-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Wanted—Experienced furnace salesman. Must be experienced in forced air and gravity heating. Address A-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

WANTED

Dealers and Agents to sell our Forct-Air booster fan units. Two sizes only. Warm air booster lists at $15.00. Cold air booster lists at $25.00. Write for particulars and details. H-544

FORCT-AIR COMPANY
130 South 2nd Street Rockford, Illinois

SITUATION WANTED

Situation Wanted—As West Coast territory salesman for a reputable manufacturer. Can furnish best of references. For full particulars write F-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

For Sale—Tin, plumbing and heating shop, doing good business. Good tools, machinery and stock. Fire proof building. No other shop in town. Must sell on account of old age. Shop won't be for sale long. Address W-543, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Sales and Advertising Manager

well-known in the industry and to the trade, seeks new connection with manufacturer who is interested in developing air conditioning equipment.

Broad and productive experience in all lines of heating engineering, including adaptation of refrigeration in connection with forced warm air heating systems.

Have designed several air conditioning units, and improvements in warm air furnace construction.

Member A. S. H. & V. E., A. S. M. E. Twelve years with present company

Address R-543
AMERICAN ARTISAN
139 North Clark Street Chicago, Ill.

Situation Wanted—By first class sheet metal worker, qualified in general sheet metal and heating. Would consider reestablishing some shop that has or is about to discontinue for lack of the right cooperation, such as some hardware stores have, or would consider opening shop in locality that so warranted. Illinois preferred. Address P-543, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

SITUATION WANTED

Situation Wanted—By experienced sheet metal and furnace salesman. Can handle anything in the business at the bench or installing. Best of references. Have sold as high as $35,000 a year of furnace business. Address T-543, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

TOOLS AND MACHINERY

Wanted—Four foot Chicago steel brake. Must be cheap. If edges are marred, doesn't make any difference. Address Harry Derrough, 502 North Neil Street, Champaign, Ill. O-543

For Sale—One Marshalltown Lennox throatless shear, practically new, No. 18. Also one set 20" forming rolls, both for $25. Address Box 141, Auburn, Indiana. X-543

BOOKS

Exhaust and Blow Piping, by Hayes—Exhaust and Blow Piping has had an unusually big demand. A fresh supply is now off the press and is in our hands for immediate delivery. It has an invaluable treatise on the planning, cost, estimation and installation of fan piping in all its branches, giving all necessary guidance in fan work blower and separator construction. 159 pages, 5x8. 51 figures. Cloth. $2.00. Order from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

Here are the two books that most sheet metal workers and contractors classify as the most complete books on Sheet Metal Pattern Cutting. The Universal Sheet Metal Pattern Cutter, Vol. 1, deals with every phase of inside work, including Heating, Ventilating, Blower and Exhaust Piping Connections, Marine Sheet Metal Work, Automobile Sheet Metal Work, Machinery and Belt Guards, etc., Mensuration applied to Sheet Metal Work, etc., with many features of construction and Labor-Saving Methods also given in detail.

Vol. 2 deals with every form of Outside and Architectural Sheet Metal Work. A treatise on Drawing, Full Size Detailing and Lettering, Construction of Cornices, Skylights, Molding, Copings, Electrically Illuminated Signs, etc.

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ALSO THE OCCASION OF THE ANNUAL MEETINGS OF THE
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Important changes are constantly taking place in the building industry. New metals, new methods for saving time and money and giving better service to the home and building owner. The roofer and sheet metal worker who is going to succeed is the one who is going to keep a step ahead of all of these improvements. What better way can you find to acquaint yourself with the latest developments along all lines in your industry than by attending a Conference of all interests, where sessions will be devoted to practically every problem in the roofing and sheet metal industry; where materials, equipment, supplies and tools of every description will be exhibited and where the trade itself will have a display of campaigns, sales letters, literature, time and labor saving devices; where one whole day will be given over to brass tacks discussions of business-getting methods by men who are making good.

HIGHLIGHTS OF THE PROGRAM

TUESDAY—
Architect, Owner and Organization Relationships—Round Table Discussions on Sheet Metal and Asphalt Roofing and Siding.

WEDNESDAY—
General Contractor and Sources of Supply Relationships—Round Table Discussions on Built-up and Flat Roofing, Insulation and Waterproofing Problems; and on Warm Air Heating and Air Conditioning Problems.

THURSDAY—
Making More Money in 1932—E. St. Elmo Lewis Round Table Discussions on Asbestos, Slate and Tile Roofing.

FRIDAY—
Annual Meetings National Organizations—

MAIL THIS COUPON

ROOFING AND SHEET METAL INDUSTRIES CONFERENCE
Office of the Chairman
644 Drexel Building, Philadelphia, Pa.

I will attend the National Conference of Roofing and Sheet Metal Industries at Louisville, Ky., January 25-29, 1932. Please send me full details of reduced railroad rates.

Signed .....

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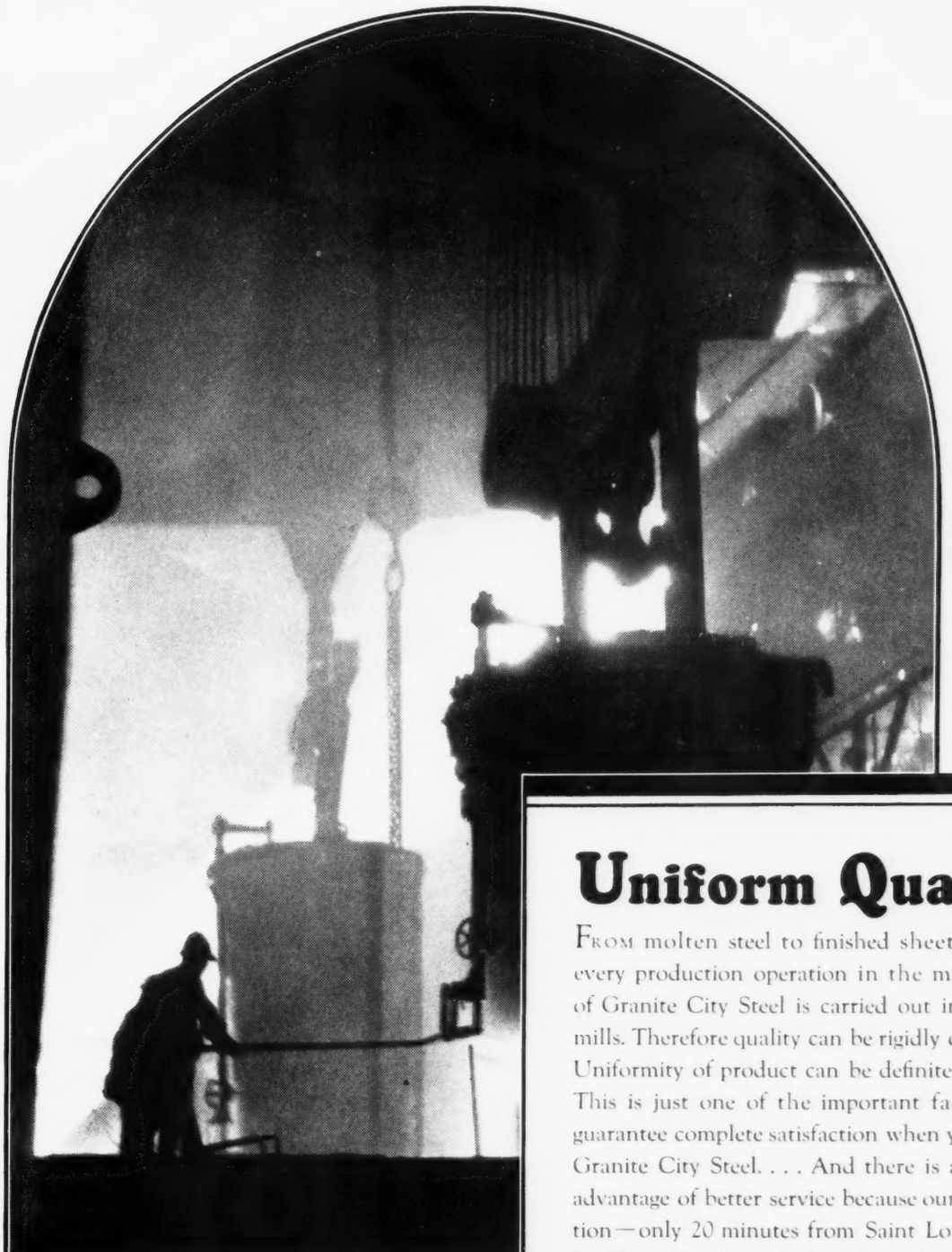
LOUISVILLE, KY. The BROWN HOTEL WEEK OF JAN. 25, 1932



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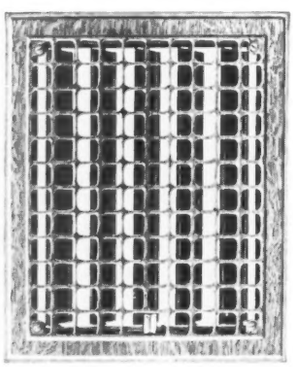
Made of unbreakable wrought steel. Unequalled in air capacity. Stocked in medium shade of oak grain and all standard finishes.



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Sets flush with plaster. Provides exceptionally attractive, secure, and easy installation. One unit of a complete line.

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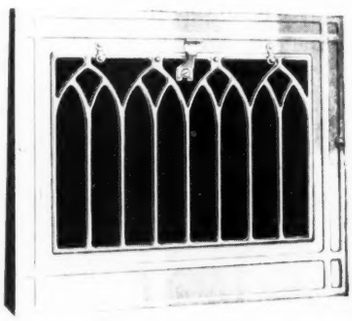
One of several gravity type baseboard registers combining outstanding attractiveness and maximum air capacity.



No. 255 Cold Air Face

Still superior to all other pressed steel cold air faces by any comparison you choose to make.

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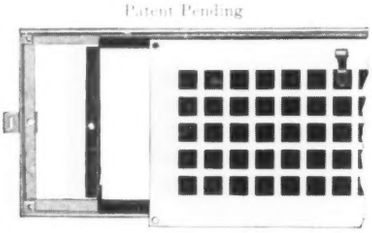

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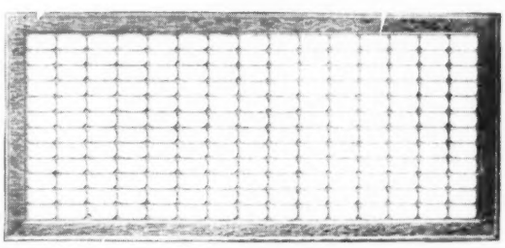

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